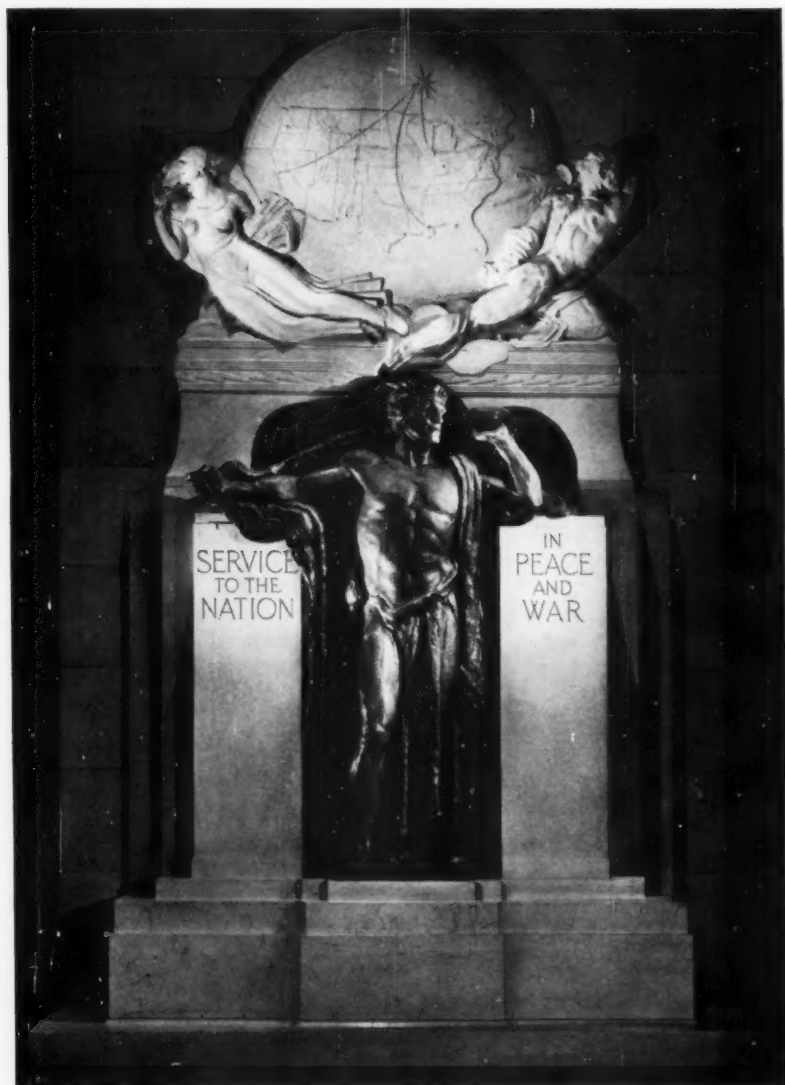


AMERICAN





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American Forests

Editor
OVID BUTLER

Associate Editors
LILIAN CROMELIN
ERLE KAUFFMAN

Published monthly by

THE AMERICAN FORESTRY ASSOCIATION

919 Seventeenth Street
Washington, D. C.

The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of two magazines—AMERICAN FORESTS and CONSERVATION, both designed to keep before the people of the country important conservation questions and issues, the Association carries on educational programs in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

The Association is independent and non-commercial, and has no connection with any federal or state governments. All its resources and income are devoted to the advancement of conservation in the interests of public welfare. All citizens are welcomed to membership.

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The Editors are not responsible for loss or injury of manuscripts and photographs while in their possession or in transit. All manuscripts should be accompanied by return postage. The Editors are not responsible for views expressed in signed articles. Notice of change of address for AMERICAN FORESTS should be received by the tenth of the month preceding issue. Entered as second-class matter at the Post-Office at Washington, D. C., under the Act of March 3, 1879. Acceptable for mailing at special rate of postage provided in Section 1103, Act of October 3, 1917, authorized July 10, 1918. Additional entry at Baltimore, Md., December 29, 1931.

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Who's Who

Among the Authors in this Issue



Egon Glesinger

Eventually appointed Secretary General of the *Comite International du Bois* (International Timber Committee), he returned to Vienna until the Anschluss in 1938 forced its removal to Belgium in an effort to escape the Nazi menace. Subsequently, it was decided to establish wartime headquarters of the C. I. B. in the Western Hemisphere, and so Dr. Glesinger came to the United States in June of this year.

JOHN M. LOFTON, JR. (*Southern Sanctuary*), a South Carolinian, is a special correspondent for the *News and Courier*, of Charleston. A graduate of the University of South Carolina, during his college summers he worked on the Cape Romain Refuge, because of his intense interest in birds and photography.



John M. Lofton

JOHN B. WOODS (*Blitz Over the Cascades*) has his work cut out for him as Secretary-Manager of the Oregon Forest Fire Association,—now that the United States is actually at war. The protection of the vast natural resources of the West Coast is vitally important in the national defense, and it will call for the best the foresters have to give during the fire seasons ahead.



John B. Woods

P. P. PIRONE (*Tree Injections*) teaches plant pathology at Rutgers University.

A member of the National Shade Tree Conference, he has written widely in the field of tree care, and will conduct the department—"Your Shade Trees"—in this magazine for the coming year.



William Rush

WILLIAM MARSHALL RUSH (*Wildlife Census*), author and wildlife expert, is a forester as well. With the Forest Service for several years, he resigned to do free-lance writing, and among other things conducts a column on outdoor books in *Oregon Outdoors*. His principal delight is wildlife photography.

FRED W. MORRELL (*What's Ahead for the CCC?*), native Nebraskan, has held highly important posts in the Forest Service. Now chief of CCC activities of the Department of Agriculture, and a member of the CCC Advisory Council, Mr. Morrell has taken a prominent part in the Corps since its inception in 1933.



Fred Morrell

HENRY HOPP (*Mystery Among the Locusts*), of the Soil Conservation Service, is a native New Yorker. He studied in the forest schools at Eberswalde and the University of Berlin and at Nancy, France, and took his doctor's degree from the New York State College of Forestry in 1936. His interesting job at present is to find and develop superior varieties of tree crops, designed to improve and conserve soil on privately-owned land—thus raising the economic status and productive value of such land.



Henry Hopp

THE COVER—*Elk in the Winter Woods*. Photograph by William Marshall Rush.

AMERICAN FORESTS

ROAD-BUILDING POWER FOR FOREST PROTECTION

OUT of a rough California side-hill, a brawny "Caterpillar" Diesel Tractor hews a road. It's no job for a tenderfoot. Roots, rocks and stumps bar the way. But "Caterpillar" Diesels are built to go where the going is tough. When this machine puts its rugged power and deep-gripping traction behind the bulldozer, the grade gets built in a hurry.

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BIG TREES

The American Forestry Association is sponsoring a national hunt for the discovery and preservation of the largest specimens of the different species of typical American trees. Locate, measure and nominate your candidate in this competition. **ACT NOW** to make known and save the largest specimens of America's trees. For further details, send for the Association's special announcement of this Big Tree hunt. Mail your nomination with records and pictures to The American Forestry Association, 919 17th Street, Northwest, Washington, D. C.

Florida's Giant

THE cypress (*Taxodium distichum*) shown in the accompanying picture is believed to be the largest tree of its kind in the United States. Located near Sanford, Florida, it was already centuries old when Columbus sailed west, and is now estimated to be between 3,000 and 3,500 years old. It towers above the surrounding forest, reaching a height of 126 feet, and has a trunk forty-two feet in circumference. A part of the surrounding swamp has been set aside as a park. A footpath leads to the tree, and each year hundreds of people go to see it.

In 1936 the Sanford cypress was photographed and nominated to the Association's "Hall of Fame" for trees by Devereux Butcher, and was later entered in the big tree campaign by him when he joined the staff of this magazine.

Several other large cypresses have been reported, but the Sanford tree remains king. Can it be that, tucked away in a Southland swamp, there is a larger cypress yet undiscovered?

Is this the nation's largest cypress? Your big tree editor believes it is. Can you prove otherwise?

AMERICAN FORESTS



THIS nation being now at war and the issue of a finish fight for the rights of free men to live as civilized free men wish to live being cleanly drawn, it is more important than ever before that our natural resources be well guarded and that they be used with the least possible waste. This to the end that every stick of timber, every pound of metal,

every gallon of gasoline, every acre of soil, may contribute in fullest measure to the single and supreme purpose of ultimate victory.

A glance over the battle fronts which gird the earth today drives home the fact that the world conflict in large measure is a war for resources. If it proves to be long drawn in time and human endeavor, as now seems likely, it may well be that natural resources will decide the issue.

The American people are doubly blessed with an abundance of many resources not the least of which are forests. As a victory resource, our forests are all too little appreciated. They are not in the headlines because their services are not spectacular and there has been no critical shortage. But they are nevertheless soldiers in every camp, on every front, in every battle. You will find them in the barracks that house our fighting men, in the powder that hurls our shells, in the charcoal of our gas mask, in a thousand other seen and unseen places where the American "V" now is being forged with blood and sweat.

The free flow of wood from forests to mills, to factories, to training camps, to battle fronts, is critically vital to sustained and successful warfare. Cut that stream and wheels somewhere along virtually every line of our military production and movement will slow down or stop. Guard well then, we must, our sources of wood—the forests.

As conservationists, we must not forget or let the American people forget that of all our natural resources forests are subject to the highest hazards of destruction. Unlike metals that lie hidden in the earth, they stand boldly on the hills and in the valleys, openly exposed to vagrant forces of destruction. A single fire set through carelessness or by the saboteur's hand may destroy within a day wood for a million crates needed to carry food and ammunition to our soldiers fighting on distant fields. Or a sudden epidemic of insects not speedily controlled may within a few weeks rob a thousand factories of forest products essential to keep assembly lines flowing.

As a symbol of preserving for the good of all, conservation has come to a great test—the test of ability to put first thing things first quickly as exigencies of the day may dictate, to knife out traditional ingrownness, to set aside small controversies, to postpone cherished projects that can wait, and to make as its supreme and compelling FIRST the winning of this war.

Whether victory be quick or slow in coming, we know that back of every battle to the very last we shall need our forests. And we know that after that we shall continue to need them for building of the peace.

As this is written, men are guarding vital railways, bridges, factories, cities. That same spirit of guardianship must be aroused in our people for our forests. Here is a conservation FIRST that goes all the way through—a task vital to the hour because it is vital to the winning of the war and to the winning of the peace.

Orin Foster
Editor.



An oil painting by Rudolf Haybrook, of England, who served as an auxiliary fireman in the London Auxiliary Fire Service during the great fire in December, 1940. Used through the courtesy of the British Press Service

THE GREAT FIRE OF LONDON

Devastation such as has descended from the air upon London, Coventry and Rotterdam, along with heavy drain and destruction imposed by war's necessities and battles, are creating great problems in wood supply for this and the post-war era.

FOREST FUTURES

As Seen Against a Background of World War

BY EGON GLESINGER

WHAT effect is the war in Europe having upon the forest resources of the countries involved? And what effect will it have upon the post-war supply of wood and the world movement of forest products?

These are interesting and important questions which obviously cannot be answered with finality at this time. But to one who for many years has studied the forest resources and timber commerce of the important countries of the world, certain conclusions are beginning to emerge. President trends, it is to be expected, will be intensified by the duration of the conflict.

Obviously war and preparations for war levy a heavy drain on a country's forest resources because wood plays so large a part in military material and action. But the effects go much further. Every major war leads to the disruption of trade relations between countries and subjects the people, particularly those dependent on imports, to the use of commodities to which they have not been accustomed. These commodity changes often have lasting and far-reaching results.

For example, the British blockade of World War I deprived Germany of Chile nitrate which had been a vital element in the former's production of explosives and fertilizer. Under pressure of military need, Germany developed a method of producing nitrate from the air. The method proved so satisfactory that it was retained after the resumption of international trade with the result that Chile lost one of its large markets for nitrates. On the other hand, various crops were developed in America between 1914 and 1918 to save Europe from starvation and ever since the European continent has remained a large buyer of American farm products.

There are indications now that the present war may bring about profound changes in the world situation as respects forests and timber trade—a change that may produce for forestry and forest industries as far-reaching effects as World War I did for farmers throughout the world. This statement takes on

By study and experience, the author of this article is well qualified to discuss the impact of the war upon European forests and its possible effect upon the world forest situation when peace returns. Since 1933 Dr. Glesinger has been secretary-general of the Comité International du Bois (International Timber Committee) with headquarters first in Vienna and more recently in Berne, Switzerland. In his directing capacity of this world organization it has been his responsibility to keep in close touch with forest conditions in all countries and with the changing world supply and demand for forest products. Dr. Glesinger is now in America for the purpose of establishing headquarters of the organization in the United States during the present world conflict.—Editor.

substance when one considers the forest resources of the countries of Europe and the impact of the present conflict upon them. Prior to the outbreak of this war, commerce in forest products was pretty largely confined to hemispheres. The nations of Europe whose own forests were insufficient to meet their demands drew upon

those European countries which had forest surpluses for export. For example, Great Britain and Eire to make good their wood requirements had to import five billion board feet: France, Holland, Belgium and Spain two billion board feet; Germany one billion board feet and the Mediterranean countries, including Hungary, one billion feet. These countries in short required a total of nine billion feet of lumber over and above what their own forests could supply. This deficiency was made up by imports of three and one-half billion feet from the Scandinavian countries, two billion feet from Russia, two and one-half billion feet from the Baltic states, Poland and central Europe, and one billion feet from Canada and the United States. The small extent to which the western hemisphere was drawn upon will be noted.

The above situation is now being fundamentally changed by the devastation and economic disruptions of the war as will be seen from a brief review of trends in the European forest situation.

In central Europe, which heretofore has played a large part in helping to meet the wood shortages of the countries mentioned above, the forest capital of Poland, Czechoslovakia, Yugoslavia and Rumania, as well as the Baltic states, is dwindling. Since the annexation or domination of these regions by Germany, the depletion of forests has been pushed to extreme limits. During the first year of occupation, cuttings in the so-called "Polish Generalgouvernement" have been pressed to five or ten times the normal capacity of the forests and these practices continue.

In the Bohemian Protectorate, German authorities are working under instructions to fell all the wood they can find. No definite information is yet at hand

about German and Italian measures in Yugoslavia, but preliminary reports show that especially the Italian authorities try to meet the desperate timber shortage of the mother country by means of extremely heavy fellings in Croatia and the other regions under their control. In Rumania, the forests were in a very bad state and the heavy requirements of rearmament and of the Russian campaign have led to further depletion.

It is quite possible that the large forests of these central European countries will not even suffice to meet the reconstruction demands at home. They can certainly be disregarded entirely as surplus regions for the future.

Russia is a country of great forest surpluses but here economic dislocation must be taken into consideration. It took eight years before wood exports from Russia were resumed after the last war and only in 1929—twelve years after Brest-Litowsk—was the Soviet Union in a position to reach her normal lumber export capacity of approximately two billion board feet. Of these quantities, sixty per cent came from the port of Leningrad, thirty per cent from the White Sea, and ten per cent from the Black Sea. These names sound familiar today because of their mention in war bulletins. This implies that it will again require many years before transportation facilities, sawmills, and shipping installations will be sufficiently restored to permit a resumption of Russian wood exports. It remains to be seen to what extent the permanent productive capacity of Russia's traditional wood exporting areas is now suffering from aerial bombardments, land warfare, and the application of the "scorched earth policy." According to recent reports received from the Ukraine, all sawmilling equipment and lumber stocks have been systematically destroyed by the retreating Soviet armies. Also, the hutting requirements of six million men engaged in a moving warfare on the Russian front constitute an enormous drain on the forest reserves in or near the fighting areas.

Germany, despite its widely heralded forests, has been overcutting for some years. Almost immediately after coming into power, the Nazis systematically started to cut one hundred and fifty per cent of normal growth in all German forests and this policy has not been discontinued. By now the increment of the five coming years has been used up and even German authorities admit that a reduction of fellings at least to their normal level has become imperative. Mr. Alpers, the Nazi chief forester, indicated recently the wood consumption of so-called Greater Germany (including Austria, the Protectorate, Western Poland, Alsace Lorraine and Luxemburg) to be ninety-five million cubic meters, against an annual growth of sixty-two million cubic meters.

Thus the deficit of that area alone would amount to thirty-three million cubic meters, the bulk of which is sawn lumber and can be estimated to correspond to six billion board feet, whereas, prior to 1939, the lumber imports of Germany were only about one bil-

lion board feet a year. It can be expected that requirements will suffer a reduction after a Nazi defeat, due to a lowering in the German standard of living, but, on the other hand, German cities are likely to be subject to severe aerial bombardments before the war is over, which will increase considerably the wood requirements for rehousing and thus raise the demand far beyond the normal level.

Turning to western Europe, the pre-war consumption of wood in Great Britain, France, Holland, Belgium and Spain aggregated ten billion feet, of which three billion were furnished from local forests and seven billion feet had to be imported. These figures, it needs to be borne in mind, are based upon exceptionally low consumption in Spain due to the civil war and in France due to highly protective importing policies. Reduction of local supplies are to be expected with an increase of the post-war forest shortage in these countries.

In Great Britain, the war situation has increased the cutting of home forests by five to eight times. Instead of trifling quantities, more than a billion board feet of lumber is now being taken from the forests of the British Isles. Also in all the occupied countries and all over France home production is pressed to the limit. Therefore, it is very likely that after the war the forests of western Europe will have to be left alone for some time, and that their contribution towards requirements will fall short of their pre-war three billion board feet.

Wood requirements, however, are likely to be far beyond their pre-war figure for quite some time until London, Coventry, Rotterdam and the French and Belgian Channel coast have been rebuilt and all the homeless populations provided with proper houses. Therefore, it seems reasonable to assume that western Europe's wood deficit is likely to be very much in excess of the pre-war figure of seven billion board feet.

Summing up the preceding considerations, it is seen that the only surplus available in Europe remains with Sweden and Finland, and that reductions may be necessary in the lumber exports of these countries. It can be safely assumed that their total supply will certainly not be in excess of four billion board feet and probably very much nearer the three billion mark. These quantities correspond to only half the official German deficit. The best one can expect after a German defeat is that they will be equivalent only to the import requirements of Central Europe and the Mediterranean area.

In short, there is no prospect of European forest sources being able to supply at the same time the wood shortages of western Europe. Whether seven billion board feet or more, the requirements of Great Britain, France, Holland, Belgium and Spain will either remain unfilled—and in that case wood will cease to be an important building material in these countries—or this deficit will have to be supplied from American sources.

There is another factor to be considered—the influence of war conditions on the use of wood. The

effects of the blockade, the scarcity of foreign raw materials and wartime requirements have led in Europe to many new developments in the methods of wood utilization.

In Sweden, for instance, wood and charcoal driven motor vehicles totalled 64,000 on August 1, 1941, and only a shortage of tires is to be blamed for the fact that licenses for a further important number of generators have been refused. The bulk of Swedish industry is now equipped to use wood fuel instead of coal. Wherever domestic heating is not provided by electrical equipment (waterpower) it is assured by wood burning stoves of new designs and much increased efficiency. Furthermore, Sweden is now subjecting about 300,000 tons of wood cellulose to special treatment which makes it suitable as food for cattle and hogs. It is intended further to develop this utilization and thus help to preserve a certain part of Dutch and Danish cattle, which used to be fed with overseas crops.

An increasing portion of the sulphite pulp production is used for artificial silk, rayon and artificial wool manufacture. The sulphite lutes are transformed into wood alcohol for motor fuel and important quantities of liquid fuel are produced by an increasing number of wood sugar plants, working along the methods of Bergius, Haeggund, Scholler, or Asplund. It has been found that wood tar is a very valuable chemical raw (Continuing on page 36)



Charcoal generator of one of the 64,000 wood and charcoal driven motor vehicles in Sweden



This charcoal generator powers the tractor that draws the plow on farm lands in Switzerland today. Here and throughout the Continent the use of wood burning generators is also increasing



SOUTHERN SANCTUARY

Cape Romain Refuge, Where Eagles Soar with Ducks in the Carolina Twilight

By JOHN M. LOFTON, JR.

Photographs by the author



Royal terns nest in great colonies at Romain—their eggs strewn the beach.
Above, Pelicans circle nonchalantly over the marshes of picturesque Cape Island



"W H A T'S that whirring noise?" piped an alert, middle-aged woman, looking out of the speedboat into the winter

twilight. Her guide raised a warning finger and cautiously dropped anchor into the glassy water. Then almost reverently he pointed toward the west where the sun, on departing, had drawn a velvety golden-orange curtain across the back-drop of the sky. Her searching eyes followed and then she, too, voluntarily fell silent.

Out of the rosy depths of the curtain came the whirl of wings—birds on their way across a sea of green salt marsh to the night feeding ground. They might have been so many mythical performers floating across a stage which Apollo had set for them, so profound was the feeling they stirred in their audience. The stage was the Cape Romain National Wildlife Refuge in South Carolina. Actually, the performers were myriads of mallards, black ducks and pintails rising from their resting places and literally darkening the sky as they passed overhead, the drone of their wings making them seem like Nature's air force on parade.

By conducting parties such as this—there were three in this group—officials of the U. S. Fish and Wildlife Service are trying to impress upon the pub-



The guide points to a passing flock

lic the need for wildlife conservation. By the establishment of such sanctuaries as the Cape Romain Refuge, the Service is attempting to restore ducks and other wild creatures to something like their



Bull's Island, vital link in this great seaside sanctuary, is seven miles long

Devereux Butcher

former status. From its southern boundary seventeen miles above historic Charleston, this great seaside sanctuary stretches northward along the coast nearly to the mouth of the Santee River. Within its bounds come Bull's Island, Bull's Bay, Cape Romain—in all 60,000 uninhabited acres,—twenty-one miles of marshy coast country. The refuge headquarters are at McClellanville. To this point go numerous visitors, and from this point the area is managed.

But Cape Romain was on the maps of history long before it became a red-letter name on the maps of

ince." In 1670 an English emigrant ship, the *Carolina*, hove to off the glaring white strand of an island, called Oniseaw by the Indians. The settlers paid a short visit at Oniseaw, then moved on to found Charleston. Bull's Island, or Oniseaw, remained the home of Indians, the rendezvous of pirates, the ranging ground of deer.

Its most colorful occupants, the pirates, used to watch from Lookout Hill and then sally forth to grab unsuspecting merchantmen. What happened to the roving raiders no one knows. But some say that the old tabby fort commanding the island's anchorage and a brass cannon found in a creek bed are mute evidences of their adventurous stay. Through the years the island changed hands over forty times, but was used for little besides pasture land and hunting preserve. It was purchased by the United States in 1935 and, still wild and tropical, today makes a valuable unit of the Romain Refuge.

White men figured little in the story of Cape Romain itself until a lighthouse was built to warn shipping away from the treacherous



ornithologists. In 1525 a Spanish expedition under Lucas Vasquez de Allyon sailed in behind this cape to the mouth of the present Santee River and started a colony—the first white settlement on the Carolina coast. But swarming insects in the marshy lowlands soon convinced Vasquez that the country was untenable. He hauled down the Spanish flag and left the place to the sovereignty of raccoons and clapper rails. The mouth of the Santee remains to this day the abode of wild things.

Apparently, after Allyon, no white men came near the Santee or Cape Romain for many decades. Then an English explorer, Robert Sanford, sailed by the cape in 1666 and reported in his narrative of the voyage how he had changed the Spanish name of that "easterly cape" from San Romana to Cartrett "in order to blot out all foreign titles from the prov-



Monster loggerhead turtles come in to the beaches only to lay—tens of thousands of eggs. Above—an attendant demonstrates the sport of turtle-riding

Romain reefs. Constructed in 1827, the first lighthouse was too low for good visibility at sea, so the famous leaning light was erected. This 155-foot tower was built three feet and eight inches out of line, but it remained in use from 1857 to 1937. Its 390,000-candlepower revolving beacon signaled "Romain" to ships at night. When shipping lanes went farther out, the powerful light was unnecessary and was replaced by a small automatic light requiring no keepers. Now all that remains is the aura of mystery that has always surrounded the light.

Tales of the murder committed there about 1876

have grown more gory, and the box of money said to have been concerned has become bigger and more valuable with the years. Local people have had dreams of buried treasure and have gone to dig in the sands near the tower, but nothing more valuable than some bleached human bones has yet been unearthed. So the lighthouse property too has reverted to the call of the wild. The tall, black-and-white tower now stands grim, silent, abandoned, half-blind, a lone watcher over tern and pelican colonies, untouched by man, yet a paradoxical reminder of man's progress which builds things and leaves them to founder in its wake. And so each section of the refuge has played its part in the story of local history.

Arthur T. Wayne, South Carolina's famed bird scientist, was the first to attract naturalists' attention to the area. Some of his now well-known observations were made on birds of Bull's Bay in the early nineteen hundreds. But not until 1930 did Cape Romain become a government refuge. From Roosevelt I to Henry Wallace and Roosevelt II, high officials had become ever more interested in wildlife conservation, and in 1929 the Migratory Bird Conservation Act authorizing the general purchase of refuges was passed. Cape Romain was the first land to be bought under its provisions. It was the apparent last stand of waterfowl that prompted the Biological Survey, now the Fish and Wildlife Service, to start its bird refuge program. Placed at convenient locations along America's four great migration flyways, these refuges serve as resting places or breeding grounds for thousands of birds. The refuges have fulfilled their purpose. Not only has the Service brought about a remarkable increase in waterfowl, but it has become interested in all kinds of wildlife on its sanctuaries. At present 266 areas for birds, big game and general wildlife are being maintained in continental United States and Alaska. Ranging in size from a quarter acre to nearly 3,000,000 acres, the areas are visual proof of an organized program to conserve the nation's living natural re-

sources. One look at the Romain area from the balcony of the leaning tower shows graphically its adaptability to the conservationist's scheme. Within sight of the balcony comes nearly every type of terrain to be desired by wildlife in this section. From the tropical tangles and open woodlands of Bull's Island to the desert-like expanses of Cape Romain, every marsh and tortuous creek, every tidal strand



Bird watchers keep busy on enchanting, tropical Bull's Island

and brown mud flat has its specific occupants. They have immense privacy, as it were, for their home swallows them in its magnitude and isolates them from influences that might be harmful. Far to the northwest the forests of the mainland are separated from the refuge by the gray line of the intracoastal waterway. Between the waterway and the narrow beaches of Cape Romain and Raccoon Key lie five miles of dense salt marsh. Ramshorn Creek, guard-

ing the eastern flank, may be seen wriggling snake-like between the waterway and the sea. Away towards Bull's Island in the southwest the refuge spreads green, hazy, then out of sight.

To supervise this vast wildlife estate with its ponds, its boats, its towers, its grand expanses, the Service must have a capable personnel. Andrew H. DuPre, young, red-haired, a native of McClellanville, and a graduate of the University of South Carolina, is the hard-driving, efficient manager of Romain. Visitors are amazed by his ability to identify, without the use of binoculars, the species of a duck or a shorebird when it is a mere speck in the distance. As biologist and assistant to DuPre is William P. Baldwin, Jr. Lean, blue-eyed, entertaining, he is likely to be remembered by visitors for his wit and enthusiasm for nature. Having recently received his degree in wildlife management from the Virginia Polytechnic Institute, he has a keen perception of wildlife problems. The solutions of these problems by thorough biological studies, he has shown, will lead to better methods of management.

A third member of the refuge staff is W. Leroy Hills. An accomplished boatman and a native of the Carolina coast, he knows the country and its ways. He is stationed as patrolman at Bull's Island. It is part of his job to conduct parties on tours of the island. He sees many museum curators, natural history students and photographers, for Bull's Island is a paradise for these people. It has a variegated population ranging from alligators and otters to wood ducks and warblers. The large Dominick house, built on the island by a former owner, is furnished so that visitors may arrange to stay overnight if they wish.

To aid them in their work, refuge men have a speedboat at McClellanville, a launch for ferry service between Bull's Island and the mainland, and numerous small boats. There are steel watch towers at McClellanville, Bull's, and other points advantageous for observations.

Like the Fish and Wildlife Service's national program, development work at Cape Romain with its consequent results has been fast-moving. Fifteen hundred acres of salt marsh have already been converted into fresh water duck ponds. Through the use of CCC and WPA labor, two and a quarter miles of dykes have been built, and a thousand acres set out in new food plants. Comprehensive life history studies of refuge inhabitants such as the loggerhead turtle and the raccoon have led to new discoveries. Last summer refuge officials caught huge sea turtles as they came out to lay, and marked them with aluminum tags in order to find something about their migration and nesting habits. Some of the creatures weighed as much as 300 pounds. Later the young were penned for examination and study. Only recently a new sub-species of deer from Bull's Island was described. During the past three years nearly 5,000 Romain birds, representing some thirty species, have been sent out with bands on their legs. Reports of band recoveries have come

from Canada, South America and the West Indies.

Refuge managers DuPre and Baldwin are now carrying out a scheme that may produce results of even more outstanding significance. After carefully conditioning Bull's Island, they are live-trapping pure blooded wild turkeys along the Santee River and releasing them on this isolated area. They hope to develop the island into a satisfactory breeding ground for this great American game bird that has lost large portions of its range.

If the plan succeeds, Romain will then provide protection for another form of wildlife that is being pushed out of its haunts by human invasion. It already preserves or fosters the increase of mink, otter, loggerhead turtle and clapper rail. These last two forms have conspicuous reason to be thankful. Shying away from the inhabited beaches to the north and south, the loggerhead lays its eggs in tens of thousands along Romain's lonely ocean front. This area now appears to be the most favorable breeding ground for this species of marine turtle on our whole Atlantic coast. Since the clapper rail is hunted extensively in areas adjacent to the refuge, this bird has naturally found sanctuary in Romain's marshes.

No hunting of any kind has been allowed since the Service has had charge of the area. Special permits are issued to people who want to land on the beaches to fish. Crabbers, fishermen and oystermen have access to any of the creeks and bays, but the whole tract is carefully patrolled to give nesting birds every protection while raising their young. Small government signs set off the boundaries of the sanctuary and guarantee freedom and safety to whatever passes within.

Many wild creatures, that do not actually take shelter at Romain, find it an attractive habitat. No other refuge perhaps has so diversified a wildlife population, offering a picturesque drama at any season of the year. Summer visitors like to land on Cape Island to see baby terns and skimmers lying prone and perfectly camouflaged in the sand, or gawky, woolly-white young pelicans that croak in protest at one's near approach. The brown pelican colony here is said to be the most northern in the United States.

At the other end of the refuge the visitors may see an entirely different scene as they ride on Bull's Island's leaf-canopied roads and watch deer and fox squirrels scuttle across. Winter on the refuge presents a contrasting picture as ducks and birds of prey wing their way in with storms and lead-colored clouds and take the places of departed summer birds. The approach of spring or autumn is always heralded by migrating shorebirds. As curlews, plovers, sandpipers, dowitchers and yellowlegs throng the flats in thousands, the sanctuary seems to take on a blither spirit as though to welcome its guests. But their visit is only a resting pause in the flight to north or south. As the seasons march, so go the birds, presenting an ever-changing and colorful parade like American

(Continuing on page 48)

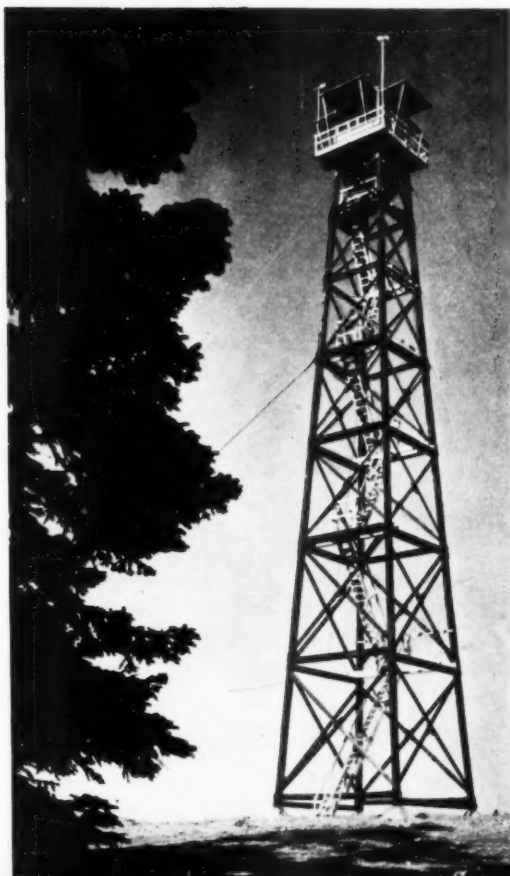
BLITZ OVER THE CASCADES

By JOHN B. WOODS

WHAT with high mountains, ground fogs and rolling rain clouds, aviators have their troubles trying to fly over the Pacific Northwest in winter. Summer time is different, and the skies are full of planes; civilians airing about on business or for pleasure, youngsters learning to fly, commercial liners droning high above wheatland and forest with such regularity that men in remote places tell the time by their passing.

During 1941, Uncle Sam brought many military aircraft to Washington and Oregon. Ground facilities were constructed to accommodate a formidable army air force. Formations of darting pursuit ships and majestic flying fortresses became as common overhead as the long lines of trucks and combat cars upon the highways.

The blitz in action over the Cascades, hanging up a 1941 record of 2,881 lightning fires





It was "all out" for the fire fighters, employing every modern technique. Here chutists are about to bail out from a plane to reach quickly a fire in remote and rough country

This intense activity in military aviation obviously was part of a plan to defend the Pacific Slope against attack from abroad. A year ago, the people of these far western States were pretty complacent; news of merciless bombings of civilians in far-away places aroused their ire, but it all was remote and could not happen here. The Pacific fleet was watching, offshore, ready for action. And during the winter our weather was a guaranty against attack from overhead, even if there had been an enemy ready to try. Fog-blanketed cities, ringed about with mountains, offered poor targets, even for peaceful landings, as too many of our own pilots proved by cracking up.

But when Spring came and the skies cleared, men began to look aloft once more and to wonder what might be in store for America, and particularly for the Northwest. Threat of war loomed larger, day by day. With a vast industrial expansion finally under way, there was much to invite hostile attention to the area lying between the Cascade summit and the Pacific shore. A great bomber factory, shipyards, metallurgical plants, lumber, pulp and plywood mills, power dams and transmission systems sketched a pattern of industry along the transportation arteries, all pulsing at top speed for defense.

To one group of Northwesterners, spring always presents a grave defense problem. They face each year the task of protecting from fire more than fifty million acres of forests in the two States of Washington and Oregon. To the fire fighters of federal forest, park and Indian services, state forestry departments and private patrol associations, and to the

bosses in a thousand logging camps, each recurring fire season means preparing with lookouts, communications, tools, and mechanical equipment, smoke chasers and shock units, to detect every fire promptly and to fight it fast and hard. This is no soft snap in normal times; virgin stands, fresh cut-overs, new forests varying in age from less than a year to more than a century, spread a patchwork quilt from remote fastnesses down to the back doors of farm house and suburban cottage,

covering nearly half of the land area, all demanding protection. And now the western portion of this region, where the hazard was gravest, and where four-fifths of the area was forest land, had taken on special importance as a defense production zone.

When serious fires occur, it always is necessary to call additional man power to supplement the regular skeleton patrol forces. Logging crews form a first reserve in and near active operations. For seven years prior to 1941, several thousand CCC enrollees have been available for emergency fire-fighting service. Then there has been scattered, but valuable, reserve of farm and ranch workers, responsive to local calls. Lastly, the city hiring halls have recruited idle civilians of varying experience and usefulness. There have been times when all these sources were drawn upon at once. But with logging crews under defense production pressure, the CCC depleted to less than forty per cent of last year's strength, farmers short-handed, cities drained of employables by boom industries, and thousands of young huskies bearing arms, the protection labor outlook for 1941 was gloomy indeed. And when April ushered in another fire season with drying east winds and many blazes on bracken-covered hillsides, there was real uneasiness as to what might lie ahead.

It was inevitable that this scary picture should be highlighted by warnings that dry forests could easily be set afire from the air with incendiary bombs. One group of defense planners tried to hush this propaganda for fear of putting ideas

Right—A chutist coming down
to do battle with a blitz fire

in the heads of people who do not like our institutions, meaning local agitators as well as foreign enemies. Others insisted upon shouting the threat aloud, hoping to arouse people in every woodland community to awareness of their peril. There were conferences with Army authorities, which were valuable as a means of establishing friendly relations, but did not produce any definite plans for cooperation, chiefly because nobody could propose detailed answers to a problem which so far did not really exist. The perennial proposal that Army flyers should watch for fires and report them to ground stations, was dusted off and then put back on the shelf to await an emergency.

Actually, of course, Army flyers cannot be expected to equal the coverage or spotting accuracy of stationary lookouts. Commercial liner pilots report several fires each year, and since these men fly their routes



Below—After a blitz—a dozen lightning
fires gleam forth in the mountainous terrain.
And fire-fighters spend no nights in bed



almost daily, their locations are accurate. Even so, they rarely score a beat on the high lookouts during the months when these stations are manned. There was tentative assurance that special Army forest patrols might be flown if and when bad weather or sabotage should put the lookouts out of business. More striking was the intimation that the Army would have numerous military patrols in the air over the Northwest most of the time, that these pilots would have their eyes sharpened for suspicious planes, and if any appeared, would take appropriate action. However, for the routine jobs of scouting fires and dropping supplies, and for the more ticklish one of setting fighters down in remote spots with parachutes, plenty of commercial planes with experienced pilots were known to be available.

Incidental mention should be made of the war games in southwest Washington, where Blues chased Reds, and vice-versa, during late August and early September. The Army sought advice from the forest protection forces and then followed it to such good effect that even with ninety thousand men shooting blanks, smoking cigarettes and building camp fires when they were lost, there were only three reportable fires and these were promptly extinguished by the armed forces.

Meanwhile, something quite matter-of-fact and sensible was being done about the matter of defense on the ground. Under leadership of the Secretary of Agriculture and the Forest Service, Governors and Congressional delegations of the two States asked for and obtained from the Congress a deficiency appropriation of \$500,000 for use in the western portions of the two States to intensify regular protection of forest areas. Justification was found in the fact that hazardous forest areas, supplying essential raw materials, extend to the very mill yards and surround many industrial communities, where defense manufacturing is under way. Early in July, the protection agencies recruited, equipped and distributed at strategic spots some 850 special fire fighters; local men experienced in quick action against fires; and a number of college huskies, who had been given special training in modern fire fighting techniques on the chance that they would be hired by the protection agencies. By July 14th, they were in the woods, alongside the regular forces, ready to go, and they did not have long to wait.

Normally, lightning storms set from thirty to forty per cent of all forest fires which occur in the two States. Because national forests occupy most of the highest timbered ridges, they receive more strikes than do the state, private or other federal lands at lower elevations. In 1940, there were 1,963 lightning fires out of a total of 4,768 from all causes; 1,338 on national forest patrol areas and 625 in state and private patrol districts. But in normal years, the number of strikes which start fires during any single electrical storm is not large enough to do more than give lookouts and smoke-chasers a good warm-up. And usually the storms are scattered as to time and place, within certain well defined areas.

However, old Vulcan must have regarded the 1941 defense activities and "ersatz" war games as a challenge, and he must have decided to give the forest protection boys a taste of intensive incendiary bombing. For shortly after noon of July 14th, squadrons of thunderheads appeared over various Cascade ridges and opened up with some of the heaviest lightning ever seen in these parts. The high country east and south of Eugene bore the brunt of this first attack, but there were local hot spots all over the Northwest. Few protection men anywhere in the region spent that night in bed; those not hitting the trail were glued to telephones and short-wave radio sets. Next day, before the defense forces could ascertain how many fires were burning, Vulcan was at it again, on a wider front, setting more trees ablaze. When he finally withdrew, with a parting local "blitz" here and there, the score stood at 1,014 blazes on National Forests and more than 300 elsewhere.

The following week was one that tested detection and suppression forces as they rarely have been tested, anywhere. There were fires in the Olympics, the Siskiyou and at various places along the Coast Range where lightning is almost unknown. The presence of extra patrolmen was providential in such localities. Weaknesses were disclosed, but notable effectiveness also was revealed, highlighted by novel techniques involving teamwork of men and "gadgets." In certain areas where blazes were many, accurate spotting from lookouts by triangulation was impossible, because observers could not be sure that they were sighting the same fire. Many were set in remote places which could be reached only by plunging through jungles, afoot. There were strikes in old burns where snags stood twenty to the acre, and strikes in active operations surrounded by unburned slash. Men ranged the back-country in pairs, equipped with light radio sets and hand tools. Wherever pickup trucks could operate, the shock units rushed in with hand tools and portable pumps. Logging crews and bulldozers attacked the slashings and snag patches, aided by large trucks for pumping out. Because the season still was young, nothing less than complete extinguishment would suffice. All things considered, suppression of 1,300 fires constituted a sizeable chore; yet at the end of ten days, less than a dozen remained active and within another week these were extinguished. The burned area toll of Vulcan's blitz amounted to about 8,000 acres.

For a sample of hectic but purposeful activity, one might examine eastern Linn County, Oregon, where more than 200 fires were set by lightning and three got out of hand. There was the McDowell Creek blaze, which started in active logging operations and ran over 3,900 acres of cutovers and green timber. The Crabtree Fire ran through 1,300 acres of old burn and furnished the Linn County Fire Patrol Association excitement in plenty. Up in the Willamette National Forest, the Service had a toughie called the Tumble Creek, which covered 1,500 acres and gave the boys a chance to try their niftiest gadgets, including 'chutes and chain saws for putting down snags.

The show might be likened to a three-ring circus, with the big fights occupying the rings and numerous special acts going on outside. Association forces were aided by operators and by State men and equipment, while the local Forest Service organization was reinforced from the regional staff, all of them using whatever loggers and CCC enrollees they could get.

Light radio sets proved a godsend in directing men toward remote fires. At one point, the state radio truck put on a demonstration of saving the situation when lookouts cannot function. Thirty-one fires were burning upon an area of less than three townships. There were lookouts at either end of the eighteen-mile strip, but they could not see more than half the smokes and could not identify any for accurate spotting. A

directions for proceeding. Such expedients became common practice during the emergency and thereafter, but possibly the greatest advantage derived from these light radio sets was the saving in time and travel of men both afoot and awheel, who could report on bad fires and call for help, or receive instructions to proceed to other fires without having to drive or hike to some distant telephone.

Scarcity of labor bothered the protection forces. Mechanized equipment therefore had to be called into play wherever it offered possibilities. Giant bulldozers, which can build fire line faster than forty men, were a power during the initial attack, and whenever the flames made runs thereafter. For mop-up in mid-summer, portable pumps and big tank trucks were re-



Another modern device — a gasoline driven chain saw — brought into action to speed the felling of dead snags, up which ground fires may run like ascending rockets to scatter sparks to the four winds

road dipped into the northern side and the radio car was parked on a high part of that road. Several pairs of smoke chasers, some of them trained patrolmen, some loggers, were dispatched from the truck toward the nearest smokes. Each pair had a two-way set, and hand tools, including a back-pump. If they reached the first objective, well and good; they could mop it up and call back for a bearing toward the next.

But if they didn't sight the fire within a reasonable time, they reported back that they were lost and then went into an Indian routine. On the safest spot to be found, they built a small fire to make smoke, and the boys at the truck spotted the smoke and gave them

quired. On this occasion, as on many others, the State pool of fully manned machines, tools and camp equipment was of incalculable value.

The most costly labor on fires is that of snag-fallers, running to two dollars or more an hour. The Crabtree snags absorbed ten thousand dollars' worth of manual labor before the fire was over. Up on Tumble Creek, the Forest Service spent many dollars for snag-fallers, but they also used two chain saws. These gadgets worked so spectacularly that they made the front page of many a daily paper and even got a rewrite in *Time* magazine. Despite all that notoriety, it is widely acknowledged that the chain saw has important possibilities (*Continuing on page 47*)

WILDLIFE CENSUS

Counting Big Game Has Its Uncertainties—But Here's the Way It's Done

By WILLIAM MARSHALL RUSH

OF what value are game estimates? How much dependence can be placed upon their correctness? Are there 2,000,000 big game animals on the national forests? Or would 1,000,000 be more nearly exact. There may be as many as 4,000,000!

Thirty years ago forest rangers were required to do chain and compass surveys on forest homestead applications. Two or three rangers got together, one

with transit and crew would be along to retrace those lines, shoot Polaris, and the ranger too, if he had faked his figures. The job had to be done right.

In measuring a stand of timber a clever and accurate system was devised. Using a staff compass, the ranger tramped through the timber in strips ten chains apart. Every two and a half chains he set up his compass and actually measured every tree in a circle



How many elk in this moving band? It is the game counter's job to find out

as compassman, the others as swamper and chainman. Lines were run, corners set. A hundred and sixty acres "more or less, as may be determined by actual survey," were marked off to give to some poor devil that he might, thereon, attempt to make a living. After everything was done on the ground a ranger sat down to figure "double meridian distances" to find out how accurate his work had been. The allowable error in this preliminary survey was one link in each chain. If the D.M.D. figures showed more, it meant re-running the lines, because later on a regular surveyor

of fifty-nine yards radius. With a "cruising stick," itself a clever invention, the diameter breast high, and the height of the tree were computed and recorded. A map was made as the ranger plodded along, trying to keep his mind on age classes, types and other forestry terms. From his map he got acreages with a planimeter, multiplied and added and finally had a figure on the board feet of sawtimber on Deer Creek. This figure was based on actual measurements of ten per cent of the trees on that area.

Grazing surveys were a marvel of ingenuity. The



How many here?—a hundred? Or is part of the herd already in the woods?

quadrat used was a meter square, divided into a hundred square decimeters by straps and strings. Each blade of grass, each weed and tiny sagebrush was counted and plotted on a map. There was even a giant pantograph designed to set up over a quadrat for rapid, accurate plotting. When all field work was done the ranger sat down and computed. He knew how well cattle liked each kind of grass. He knew which weeds were favored by sheep. He knew because

he had followed an old cow for days watching what she ate. He had spent more days trailing an old ewe for the same purpose. *Palatability* was the word. The ranger got a figure in per cent. Next came density. Palatability times density equals forage acre factor. So many surface acres to one forage acre and it was forage acres the cows ate. Rather complex, but exact measurement of pasturage.

When the Forest Service sold logs to a customer,



Much too compact for an accurate count—and how many are over the hill?

every log was scaled, numbered, and stamped with a "U. S." When a check scaler came along he raised particular Cain if the ranger's measurements were off more than three per cent. Every cow or sheep for which a grazing permit was issued was counted, one by one, before it got on forest land. The allowable margin was one cow or sheep per hundred. Any more were turned back.

Foresters are, as a rule, particular cusses. They do their jobs scientifically. Probable errors are considered in all their calculations. Insufficient data is a bugaboo. Generalizing outside their realm of facts, emotionalism in research, impatience with conclusions of which they do not personally approve, opinions in place of knowledge, slovenliness in logic, fantastic explanations—all are taboo. Foresters know human nature well, too, which, coupled with their intellectual morality, makes them good public officials.

But they have never evolved a method of counting wildlife that is nearly as good as their work of surveying homesteads or cruising timber.

The very first game estimates put out by the Forest Service were labelled, "Game Census," which, in view of the accuracy of other Forest Service reports, were considered by the public actual counts. Later, these were changed to "Game Estimates," but not until the public in general was accustomed to believing in them. As an analgesic to that stiff forester's conscience, it was explained that "these figures, while in some cases not actual counts, are the best available."

Game estimates were made on the pyramid system. This is the way it started, twenty-five or thirty years ago: Each ranger made a guess of the number of each species of game animals on his district and sent it in to the supervisor. This official pyramided for his forest, cutting here and there, adding on somewhere else, to make it look right to him. His figures were then sent to the district office. The district forester pyramided for his district, his twenty to thirty national forests. He trimmed and filled until the whole looked reasonable to him and sent his figures to Washington, D. C., where final polishing was done.

The ranger had no chance to get out and count wild animals. There was no time set up in his schedule for such work. It was an impossible task, anyway. There were few cabins in the mountains where he could stay, and even these were not provisioned. Old Henry Smith might say he saw ten elk on top of Porcupine Butte when he rounded up his cattle. Trapper Jones saw six deer on Beaver Creek. In hunting season the ranger heard about twenty elk and thirty deer being killed. Oh, well, about two hundred elk, four hundred deer ought to be right for the report. No, round figures didn't look right. A hundred and ninety-seven elk and four hundred and eleven deer were better. So it went. Next year a small increase. Of course, business was better. Things were moving ahead. There were more wild animals.

After a few years an actual count, from horseback,

was attempted. One hundred elk and two hundred and fifty deer were counted. Fine! Now he could add thirty per cent for deer and elk that were not counted, animals that were off somewhere, not seen, but estimated. Then, too, all the ranger's district hadn't been covered. More could be added for Horse Creek. By crickety!—if that didn't give him just about what he thought he had! But say, where did that love for accuracy go? Well, who's to check on him?

Counts of the Yellowstone elk herd were begun around 1910 by the U. S. Army and civilian scouts. Later on forest rangers helped. When the Park Service took over, counts were made by park and forest rangers.

The first of these counts that I know anything about was in the spring of 1914. Forest Ranger Wesley D'Ewart and I saw the party of mounted Army officers and scouts on Hellroaring Creek. They had a pack train of fifteen mules and twelve airedale bear dogs. The elk count was a huge success. No official mention was made of the bear hunted with the aid of the airedales. Thirty-five thousand, two hundred and nine elk in the northern herd. Ninety-nine had been shipped away before the census, therefore, the total was 35,308, an "increase" of 3,079 over 1913. This huge figure had been started several years before and everyone felt it had to be carried on. When a severe winter came along the starvation loss gave us a chance to start all over with a more reasonable figure.

The forester and the game man cried out for a dependable system of counting. In 1929 there were the strip, district, party, small party and district ranger methods, each with its advantages and disadvantages. In 1930, four separate counts were made of the elk herd in the northern Yellowstone country by the same men, using the same methods. Park rangers did all the counting and they were experienced and dependable men. In January they counted 8,257; February, 7,710; March, 8,307, and April, 7,303. The April figure was eighty-eight per cent of that for March—as close as good men could come in rather open country. In the rougher, forested Flathead National Forest area five counts were as follows: December, 905; January, 1,320; March, 958, and April, 651. Discarding April, the December count was seventy per cent that of January. These elk were snowed in, no more could get in, none could get out. These were actual counts. No percentage was added for oversights, none deducted for duplications. On Sun River the elk herd count by forest rangers the same year was: December, 2,545; January, 2,429; February, 2,119; April, 2,352, and May, 1,369. February was eighty-three per cent of December. All counts were carefully done by good, experienced men.

Wildlife moves, hides, gathers in groups hard to count, runs away, doubles back. They won't stay put. The most experienced counters get very unsatisfactory results at times. Weather has a lot to do with counting. So does the time of year, even the time of day.

On a May day in 1931, counts were made of an un-



Moving antelope against a background of snow—how many?

disturbed band of 667 elk in open country. The counter was concealed from the elk at all times. He used ten-power field glasses. At 5:30 A.M., 401 elk were standing up in plain sight and easily counted. At 9:00 A. M., the band had shifted considerably and 667 were counted, 200 standing, 467 lying down. An hour later only 100 were standing, and at 2:00 P. M., only sixty-seven. Of course, some of those lying down could be counted, but not all. A different result was had in each of the four counts taken the same day of the same herd. The spread was from 200 to 667, and, of course, there could have been more than 667. No check was available to prove that 667 was the total.

Riding straight across a cattle range five miles in

sight. The elk were out in the open where grass was good. The ratio would not be the same for both.

Again, he rides for two miles on a timbered cattle range where he can see only a short distance on either side. He counts twenty cattle a mile for two miles. He knows there are 400 cattle on that area, ten times what he sees. Ten, times twenty, times two. Then he goes on to ride forty miles of mountain trails where there are no cattle and sees an average of fifteen elk per mile. Can he say there are ten, times fifteen, times forty, elk in that area? Yes, and more, too, because in timber some elk would hear a rider coming a long way off and get out of sight. The forester would say there are too many variables for accurate conclusions. I have spent a total of thirty

length on which it is known there are 1,000 cattle, a man counts 500, just half of the total. It is summer. Cattle are bunched in shady places and hidden in brush.

hours counting game from the air. In some instances an airplane finds isolated bands and a count can be made of them that could be obtained in no other way. On the whole, though, we found it an extremely unreliable method. One example may be cited. Three counters flew in a single plane over the South Fork of the Flathead River in Montana to count elk. Our

(Continuing on page 48)



Deer run, double back, hide. How many of this band are unseen?

WHAT'S AHEAD FOR THE CCC?

By FRED MORRELL

THE Civilian Conservation Corps was set up in 1933 as a work relief agency. During a seven-year period of serious unemployment, it enjoyed great popularity. As national defense got under way and unemployment rapidly decreased, however, more and more question has been raised regarding its continuance.

It is significant that those who now question the continuance of the Corps do so because of an improved employment situation. In almost every case they predicate their criticism with the statement that they do not question justification for the Corps during years of serious unemployment. This implies that to the extent justification for continuance rests on a serious unemployment situation, the Corps must expand or contract as employment varies and might presumably be discontinued entirely under favorable

conditions. Under this concept, employment in the Corps should not at any time be sufficiently attractive to induce young men to go into it rather than accept such employment as is available and at such wages and under such working conditions as are offered. And the CCC will always be in effect an emergency agency unless it be assumed that there will always exist a condition of serious unemployment. According to Census figures, even in normal times hundreds of thousands of boys leave school without getting jobs. This is chiefly because they are either unskilled or physically or mentally unfit.

More than 3,000,000 boys have enrolled in the Corps since 1933. The law requires that they be unemployed and in need of employment, and the policy has been not to enroll boys who are in school or

who intend to return to school before the end of their six-month enrollment period. CCC enrollees, generally speaking, have been the same type of boys who through volition more than through financial necessity left school and went to work when jobs were available, and who are leaving school now for the same reasons they always did. Some left because they were men-



The dwindling strength of the CCC is not due to a decrease in new enrollments (above), but to a greater number of boys leaving the Corps after practical work experience (right) for Defense jobs



tally unfit to continue academic study. Some are in vocational schools because these open the door to millions of jobs available in national defense. Some are still enrolling in the CCC largely because the Corps offers the training and experience they need to secure jobs. The dwindling strength of the Corps has not been due to the fact that fewer new boys were enrolled, but because they leave the Corps to accept jobs at a much faster rate. More new boys were enrolled during the fiscal year 1941 than in any year since 1938, but because they stayed for so much shorter time, the average number in the Corps was reduced by about fifty per cent during the year.

In considering the future of the CCC, it must be kept in mind that as measured by previous years, it has gone through an unemployment experience ranging from one extreme to the other. During the early years, as many as 1,000,000 boys might have been enrolled at one time. The present enrollment is approximately 100,000. There is no way of forecasting what the future employment situation will be, and therefore no way of planning with any assurance either for the number of boys who will be available for work in the Corps, or for the specific kinds of work training that will best fit them for the jobs that may be available



Is the original concept of the CCC as a conservation-work relief-training agency sound? And should it be continued on this basis?



Or should the CCC be viewed purely as an educational institution and become an integral part of the nation's educational system?

in the future. The national defense effort is providing more than the usual percentage of jobs in certain lines, with the result that the man with a minimum of training in certain skills can pick his job, whereas in the early days of the Corps no amount of preparation would insure a job of an applicant's preference.

It is important that these facts be kept in mind because lack of understanding regarding them accounts for many erroneous statements about the Corps.

From time to time some prominent legislator, prominent educator, or prominent somebody else, points out that maintaining a boy in the CCC costs more than it would to send him to college, and so concludes that the public should send him to college rather than to a CCC camp. Such statements have perhaps as much logic as to say that since lace curtains cost less than rugs, the housewife should have no rugs but all lace curtains. This has seemingly been the approach of many people who think of the Corps solely as a training institution, perhaps because we traditionally think of our public school system as the publicly supported educational training organization. This approach overlooks the fact that enrollees have passed the compulsory school age. As already stated, they have quit school more through volition than through economic necessity. Nearly seven per cent have not progressed beyond the second grade in school; forty-seven per cent have not completed the eighth grade; and less than ten per cent have finished high school. The majority of boys are not interested in continuing school life, although most enrollees have shown a willingness to work and to learn the skills necessary to accomplish the actual productive work to be done at the camps. The CCC has not taken boys out of school, and it has not kept them out of other jobs. It has given boys not in school and not employed important work in the conservation of natural resources, the opportunity to learn through doing, and as much related and other training as it has been practicable to offer them.

A number of leading educators in the country are now advocating that a work experience should be made part of the school curricula, particularly those of secondary schools. This attitude has probably been brought about partly by the CCC and the NYA. Educators have recognized the training and educational possibilities in a work experience and camp life, particularly for youth who have quit school at an early age either because of lack of desire to continue or because of the necessity of earning. These educators are now saying that the family unit largely provided work experience for previous generations of youth. More of them lived on farms or in small towns where out-of-school work was part of the family life. More work was done in the homes, thus providing a work experience for boys and girls. Now with greater concentration of population in cities, opportunity is not provided for a sufficient work experience.

Since these educators believe that a work experience is desirable for a considerable percentage of

young people, they argue that schools must in some way provide that experience.

It may in the future be accepted that a regular system of work camps is necessary, particularly for boys not adapted to the existing school system, or for a large percentage of boys who do well in school but who need a work and camp experience as part of their regular training. This would be expanded perhaps in times of unemployment in order to give more training and work to boys for whom jobs are not available, and also to accomplish worthwhile public works.

A recent report of the Educational Policies Commission points out that the NYA and the CCC, originally set up as temporary public works agencies to provide useful employment for needy, out-of-school youth, have taken on educational functions as well, with the result that the federal government is directly controlling and conducting nation-wide programs of vocational training and other forms of education instead of working through the established state and local agencies. Recognition of the CCC as a regular training organization rather than a work relief agency would raise the question of administrative jurisdiction. But the idea of work camps as a part of our educational system has not yet been, so far as the writer can see, generally accepted. This fact seems to be well demonstrated by current writings of editors, columnists, and others who, while condemning enrollment of boys in the CCC and the NYA on the basis that they are needed in defense work, make no similar comment regarding the continuance of boys in school. On the contrary, there is a general deploring the fact that the exigencies of national defense needs are resulting in a decrease in the enrollment in secondary schools and at the college level.

A seemingly basic premise of many people who prescribe for a future CCC is that it is no longer an emergency but a permanent institution of government that can be organized and fitted into the general scheme of things with regularity and precision. Congress has declined so far to make the CCC "permanent," and instead authorized in 1937 its continuance until June 30, 1943, at which time it will go out of existence unless continuing legislation is enacted. Since current appropriations rather than enabling legislation is the essence of continuity, this action of Congress was in one way not significant, but the fact remains that Congress did not recognize the permanency principle in 1937.

During the period from 1933 to 1937 the size of the CCC was determined by the Administration. It went from 300,000 in 1933 to over 500,000 in 1935, and back to 300,000 in 1937. That year Congress set the maximum at 300,000, which continues as the limit in basic legislation. Actual average strength was around 275,000 over a period of about four years. Current present strength is around 125,000. Current expenditures are determined not by the amount appropriated for the fiscal year, but by the number of eligible boys wishing to (*Continuing on page 45*)

MYSTERY AMONG THE LOCUSTS

Riddle of Valuable Shipmast or Old Fashioned Locust Challenges Conservationists

By HENRY HOPP

IT WAS in the little town of Dunnsville, New York, not far from Albany, that I first heard of old fashioned locust. On my way to visit a neighboring soil conservation district I had stopped to observe an unusually fine specimen of locust growing in the yard of a villager.

As I stood admiring the tree, an old gentleman came around the house. He was wrinkled and white-haired, but there was a youthful twinkle in his eye.

"That's a fine locust tree," I observed, by way of explaining my curiosity.

"Yes, sir," he said. "It is the old fashioned kind."

"Old fashioned? Why do you call it that?" I asked.

"Seems to me locust is very much in style, considering that farmers today are planting more locust than any other tree."

"Oh, those are modern locusts," he exclaimed.

Being much intrigued by this distinction, I pointed out that all locust trees belong to one species, *Robinia pseudoacacia*.

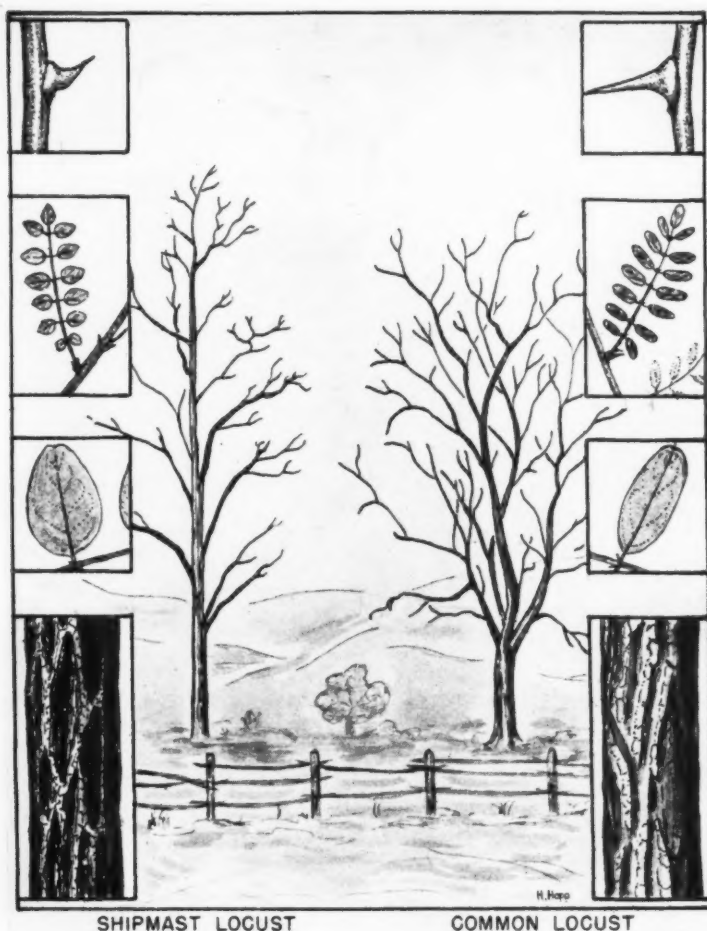
"Just as I thought," was his reply, "you are one of them scientists with fancy, high-sounding names for trees. To us old folks there are two kinds of locust, old fashioned and modern."

I pressed him for the difference.

"You stopped to look at that tree, didn't you?" he



Shipmast locust (right), newly distinguished variety, grows with a single, straight stem, while the well known common type of black locust (left) is often crooked and forked



SHIPMAST LOCUST

COMMON LOCUST

Distinguishing features of shipmast locust are found in its bark, leaf and spine

much work, I reckon. Instead they buy small trees from the nursery — trees grown from seed. All they get is modern locust.

"This modern locust bears lots of seed, spreads out more and has a wider top. Its trunk is crooked and often breaks up into small branches. Its wood is a dull greyish brown and, as a post in the ground, modern locust won't last any longer than chestnut, ten or twenty years.

"See how ridgy the bark is on this tree," he continued. "You can tell old fashioned locust by its thick bark. The bark of modern locust is thinner, scallier."

"Where did this locust come from?" I interrupted. "Locust did not occur naturally in the forests of New York State, you know, so it must have been brought in here."

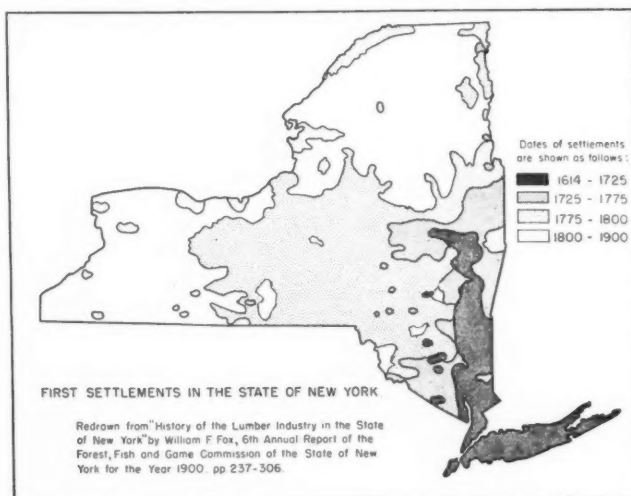
The old gentleman scratched his head. "I never heard tell for sure," he answered, "but old fashioned locust dates back to the original settlers here. This place, for example, was

explained. "Why? Because it is different. See how tall it grows. Look at its straight trunk. There is more good fence post timber in it than in two of these modern locusts. Its wood is hard and dark yellow. Ask some of the old-timers and they will tell you fence posts from old fashioned locust last fifty years or more in the ground. Also, its shade is light, and grass grows well underneath it. In the spring the scent of its flowers is mighty sweet."

"That being the case," I observed, "it would seem that more of this locust would be grown around here."

"The old fashioned locust," he replied, "doesn't produce much seed. When a farmer wants to start a grove he digs up sprouts around a neighbor's trees and sets them out on his own land. But folks don't do that much nowadays. Too

the home of Jonathan Johnson, the pioneer country doctor in this section. He rode up on horseback in 1808, built his home, and here he lived the rest of his



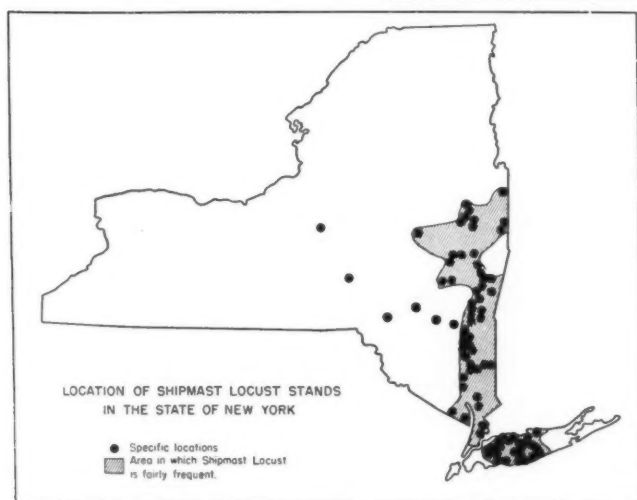
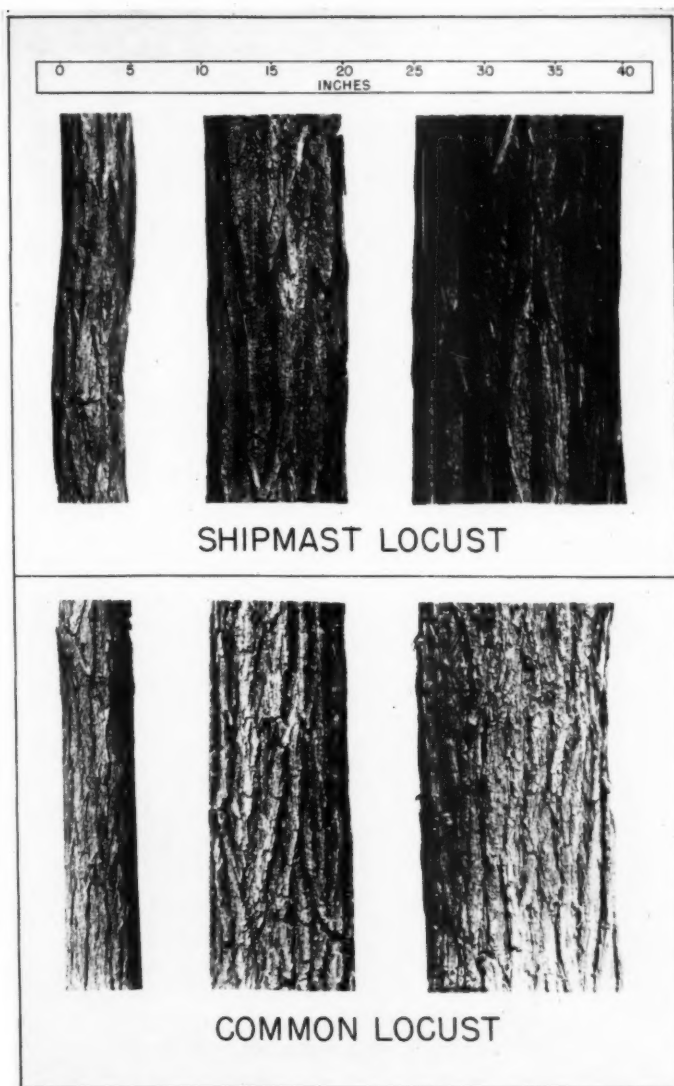
Range of the shipmast locust in New York follows early settlements

Heavy bark of the shipmast type, contrasted with the thinner bark of the common type

life. A few years ago, the state put up a historical marker to commemorate this milestone in the growth of our community. You'll find that many of the places where old fashioned locust occurs were, like my place here, the homes of early settlers."

Later that day I arrived at the soil conservation district. The district conservationist showed me what farmers in the area are doing cooperatively to stop erosion and preserve soil. They have learned that topsoil is the lifeblood of their farms, and they have joined together to restore and protect it. With government assistance and advice, they are revising their methods of farming. Among other things, they are planting trees on the steep and otherwise highly erosive parts of their farms in order to keep the topsoil on the land and out of the river.

"These erodible portions of farms must pay their share into the farmer's pocketbook," the conservationist explained, "yet ordinary species of trees do not yield sufficient return to make their culture as profitable as other farm crops. So the Department of Agriculture has started a search for new varieties of native trees that will give the farm-



er a higher return from his hillsides."

"What about black locust?" I ventured.

"Black locust," he replied, "has proved to be one of our best hill-culture trees. It grows fast on slopes, especially if the soil isn't too heavy, and is an excellent soil-holder and soil-builder. Taking the country as a whole, more black locust is being planted for soil conservation than any other tree species. Farmers like it because it gives better prospects of a profitable return than any other of our common trees."

The old-fashioned locust is found mainly in southeastern New York

Then I told him of the old gentleman at Dunnsville and what he had said about old fashioned locust.

"Yes," the district conservationist replied, "the old gentleman is right. His old fashioned locust really is a distinct kind. Botanists call it shipmast locust, in allusion to its straight single-stemmed form. It is a variety of the common locust, and its scientific name is *Robinia pseudoacacia* var. *rectissima*. A government scientist, the late Dr. Oran Raber, first officially described the variety in 1936."

"But," I interrupted, "I thought old fashioned locust—or shipmast locust—had been planted for many years."

"That's true," he replied. "Shipmast locust was grown on many of the early farms in the Northeastern states, but only recently have we come to know that the locust planted by the early farmers in this section is different from the kind that is ordinarily planted at present."

To illustrate this point, he brought out two maps.



Wood of shipmast locust has remarkable durability, proven by this surveyor's stake dated 1831

One showed the locations where shipmast locust is known to occur in New York State. The second came from an article written by William F. Fox forty years ago. It showed the dates of settlement of various communities in New York.

"We find common locust," he continued, "on farms in practically all parts of the state, but shipmast locust, as you see from these maps, is found mainly in those parts settled prior to the Revolutionary War. And the maps do not tell the whole story. The association of shipmast locust with the early history of New York makes the greatest impression when one actually sees these locations. Many of the plantings occupy historic spots. At Cazenovia, in Madison County, for example, shipmast locusts are around the house of the town's founder, John Lincklaen; at Roslyn, in Nassau County, they are on the lawn of a colonial home; at Livingston, in Columbia County, they are at the site of the Piet Bush Church, another

historic colonial spot; at Rhinebeck, in Dutchess County, they stand among the quaint headstones of a pre-Revolutionary Dutch cemetery."

"How did shipmast locust become so prevalent in this section?" I asked.

"Well, the first thing to remember," was his reply, "is that shipmast locust occurs only in plantings or in groves that have escaped from old plantings. It never occurs among native timber. No one knows for certain exactly when it was introduced into New York or where it came from. However, we do know from early writings and from old plantings still in existence that this tree was much appreciated by the early settlers. Over a hundred years ago, in 1839, Benjamin F. Thompson, the leading authority on Long Island history, had this to say about locust:

"The locust tree flourishes in this region, particularly upon Manhasset and Great Neck. The tradition exists that the first of this kind of tree ever known was brought from Virginia a century and a half ago, by a Mr. Sands, who, with his two brothers, came from Block Island, and purchased the land in the vicinity of what is now called Sands' Point, in the year 1686. From a few trees planted there by this person, all the locust trees now upon this part of Long Island were supposed to have been derived."

"And if you wonder how important locust was to the early farmers, listen to what Thompson wrote in the second edition of his *History of Long Island*, published in 1843:

"This kind of wood has already become the prevailing timber between Flushing and Smithtown, and is a mine of wealth to its respective owners.

It has, indeed, become so general that almost every farmer, in this town particularly, has his forests of locust, covering a surface of from ten to one hundred acres."

"Incidentally, some of these early writings about locust make interesting reading. One point of speculation was the number of years a locust fence post lasts in the ground. We ran across a letter written in 1817 by one Singleton Mitchill, which read:

"I have never been able fairly to ascertain how long it will last for fencing, although I have made it a subject of inquiry: one reason is, that very few persons live a sufficient age to witness the fixing of a locust post, and to see it decay or rot."

"To get back to your question, though, about the origin of shipmast locust. Three of the largest trees we have found are standing in Roslyn, Long Island, at 'Washington Tavern,' the former residence of the Bogart family. The largest (Continuing on page 46)

EDITORIAL



A CONGRESSIONAL PROGRAM OF FORESTRY

THERE is now before Congress an omnibus bill, S. 2043, embodying the recommendations of the Joint Congressional Committee on Forestry, contained in its report of March 24, 1941. The measure has great importance from the fact that it represents the findings of a special committee of the two Houses of Congress, based on a three years' study of the national problems of forestry. The committee had available a great volume of factual material and recommendations from public and private agencies, and from hearings held in different parts of the country.

The bill incorporates, directly or in modified form, the substance of numerous proposals already before Congress as separate measures. The Committee's program gives special emphasis to problems of applied forestry on private land. It provides for co-operative aid to private owners by enlarging public contributions for forest protection; advice and assistance in forest management and utilization; a system of forest credits; development of forest cooperatives by small owners; restoration of depleted farm woodlands through lease agreements; cooperative management of public and private properties within sustained yield units; and federal action to bring about State regulation of cutting on private lands.

There are further items in the bill that concern federal aid to States in acquiring public forests; continuation of the forest survey; modification of federal contributions to counties containing national forest land; and authorization for funds for forest planting on national forests. The omnibus bill omits reference to further acquisition of land for national forests, though this important feature was recommended in the report of the committee.

The measure has the weakness of all omnibus bills which contain numerous proposals involving principles of public policy. Some items are bound to be controversial, thus operating against unity of support of the measure and retarding adoption of features upon which there is little difference of opinion. Still again, a long bill such as the present one, which contains eighty pages and includes matters of highly technical character, is more than the average person can readily digest. Hence there is danger that public interest may lag and action be deferred.

Most of the provisions of the bill will meet general approval of forestry interests; other items will be strongly opposed. Chief controversy will center around the plan for state regulation of private lands. I personally dissent from this plan as inadequate to achieve the objectives of public regulation. Formerly

I believed that we should look to the states to assure, through regulation, the right handling of forest resources within their respective boundaries. More recent studies in various parts of the country have not only strengthened my conviction regarding the necessity for public regulation, but also have convinced me that the final authority and administrative responsibility for public regulation should rest with the federal government.

The program, in my opinion, fails adequately to reach the forestry problems in regions where there is wide diversification in character of forest ownership and size of properties. The economic and social benefits from forests in such circumstances depend on the extent to which the forest properties, taken in the aggregate, are managed under good principles of forestry. This is difficult to achieve unless there is joint action by the owners in protection, management, and utilization. Ordinarily each owner handles his land without reference to others. When opportunities arise to dispose of stumpage, there is a tendency for many owners to over-cut their woodlands, thus depleting the growing stock. There then ensues a considerable period for restoration of merchantable timber during which there is little or no income but continuing costs of taxes, protection, and maintenance.

The Committee recognizes this situation to a limited extent. There is provision in the bill to encourage forest cooperatives among small owners, and further, authorization for the Secretary of Agriculture to enter into cooperative agreements with owners for co-ordinated management of public and private land in appropriate sustained yield units. I favor these proposals, and I would also favor a plan to extend the principle of joint action in forest management in sustained yield units to include owners, both large and small, whose circumstances may be different from those specified in the bill under discussion.

It is important to give careful attention at this time to the question whether the recommendations of the Joint Committee are adequate to meet the pressure on our forests during the war period and subsequently. Our forests are adequate to meet the requirements, if operations are widely spread and local over-cutting prevented. Wise planning and efficient handling of resources during this crisis are imperative.

YOUR SHADE TREES:



TREE INJECTIONS

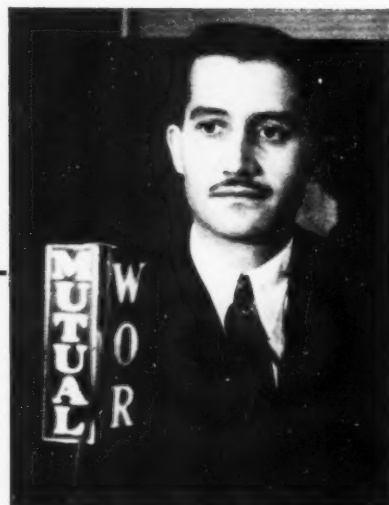
By P. P. PIRONE

WIDESPREAD publicity during the past year on tree injections as a cure for all sorts of tree troubles has made owners of shade trees, commercial arborists, and "tree-minded" individuals generally eager for more information on the merits of such treatments, so far as now known and on future possibilities in this field.

The idea of injecting a chemical directly into the tree trunk to cure or ameliorate some disease appeals to the layman, who is prone to associate this practice with inoculation or vaccination against human ills. Without going into details, however, it is safe to say that there is little similarity between injecting a chemical into a tree trunk to destroy a fungus established in it and inoculating a child against

whooping cough or smallpox.

In any case, the appeal is there, and more than one tree owner has already succumbed to the rosy possibilities described by an unethical tree man. Most of the inoculations made by the physician today are backed by hundreds of hours of research work under controlled conditions, whereas, with few exceptions, the tree injection treat-



AMERICAN FORESTS is fortunate to be able to announce that Dr. P. P. Pirone, author of this article, has been engaged to conduct "Your Shade Trees" department during 1942. Dr. Pirone is one of the outstanding men today in the shade tree field. At present Associate Professor of Plant Pathology at Rutgers University, he has specialized in diseases affecting ornamental trees and shrubs and has had many years' experience in research and in dealing with the problems of tree owners. He is therefore admirably equipped to keep readers of this department well advised as to latest developments and improved methods in the care of shade and ornamental trees.



Injection treatment — (left) A hole is bored into the sapwood with a one-half inch bit, preparatory to inserting the capsule; (right) the author inserts a collodion capsule containing five grams of ferric phosphate

ments now being commercialized are based on hurried, unscientific observations by men who are unqualified for such work. The ease with which the layman can be sold on tree injections is well illustrated by the large number of jobs sold to owners of elms and other trees in the Middle West and in the South last year.

The presence of a destructive virus disease of elms known as phloem necrosis and the extensive publicity on tree injections made tree owners in those sections of the country particularly susceptible to unscrupulous tree men. The so-called "arborists" claimed to have a secret material that would cure elms affected by phloem necrosis, and they sold many a tree injection job because of it. If such a material actually exists, it certainly was not discovered or developed at any state or federal experiment station or by any reliable tree company—otherwise more information would be available on it.

Actually the idea of injecting chemicals into trees to cure diseases or lessen their harmful effects is not new. Reference to these possibilities are found in the literature as far back as the twelfth century. Within the last

fifty years numerous reports have appeared, some admitting complete failure and others claiming considerable success.

The most recent work (which is largely responsible for the present enthusiasm among lay and professional arborists) is that initiated several years ago at the Rhode Island Station and now being continued by a well-known tree company.

There are two well-defined and sharply differentiated objectives of tree injection work. The first, and the one the layman commonly associates with the practice, is the arresting of growth or the complete destruction of parasitic organisms (usually fungi) already in the tree. This objective has been expanded recently to include the counteracting of toxic effects produced by the parasitic organisms.

No clear-cut data have been published which show that the injection of chemicals into diseased trees will arrest the growth of, or destroy, the causal fungus. In other words, no definite cures of fungus-infected trees have yet been clearly demonstrated. Perhaps the major feature responsible for the failure to effect cures thus far is the lack of a highly selective chemical that will destroy the protoplasm of the parasitic fungus without at the same time injuring the protoplasm of the host tree.

Successful injection into woody stems is further complicated by the fact that the injected material will come in contact mainly with fungus tissue directly above the point of insertion. The failure of the oft-reported attempts to cure chestnut blight lies not only in the lack of a highly selective chemical but also in the inability to get the material from the sapwood, where it is inserted, out to the inner bark, where the fungus is concentrated. Few materials can move laterally in the trunk: the author is aware of only one thus far found. The material known as "Neoprontosil," so widely used in the treatment of human disease, appeared to have moved laterally, according to research workers in the Division of Forest Pathology Laboratory at Morristown, New Jersey. The value of this material as a fungicide, however, is still unknown.

As to the accretive phase of the first objective, some evidence is at hand that indicates that certain materials have an antidotal effect on toxins produced by tree fungi. Urea, a common fertilizer constituent, and several other materials were said by Dr. J. G. Horsfall, at the National Shade Tree Conference meeting in August, 1941, to have antidotal properties on some fungus toxins. More recently, Dr. Frank Howard of the Rhode Island Experiment Station reported that a 0.5 per cent aqueous solution of dihydro-chloride salt of di-amino-azo-benzene plus a solvent and a penetrant

(known in the trade as "Helione Orange") overcame the toxic effect of the bleeding canker fungus, *Phytophthora cactorum*.

These researches indicate that we are only now beginning to proceed in the proper direction, but we are still far from attaining the primary objective of tree injections, namely the arresting or destruction of parasitic organisms in trees without harming the trees.

The second objective of tree injections, and one about which a number of published articles and data are available, involves the supplying of nutrient materials of which certain trees may be lacking. Though attainment of this objective has been successful in many cases, limitations are apparent. Because distribution

case occurs in pin oaks and many other trees growing in soils that are not acid enough. Under such conditions, iron, though present in the soil, cannot be absorbed through the roots, and the lack of it in the leaves results in yellow (chlorotic) foliage and stunted twig growth.

To supply this lack, holes were bored with a bit one-half inch in diameter, to a depth of an inch or two, at an oblique angle in order to penetrate as much of the sapwood as possible. The holes sloped slightly downward to prevent the iron solution from dripping back when the salt dissolved. In trees over four inches in diameter, at least three holes were placed equidistantly around the trunk. A veterinary size collodion capsule containing five grams of ferrie phosphate was



Proof of successful trunk injections, for the pin oak at the right—previously chlorotic—is now normal after treatment and the tree at the left, untreated, has yellow, sparse foliage and poor twig growth

of any injected nutrient is mostly vertical, several openings must be made around the trunk to insure fairly uniform distribution, and openings in the trunk are potential doorways for the entry of wood-decay fungi.

Under certain conditions, however, injection of sorely needed nutrients into the trunk may be justified, especially where the roots of city trees are largely covered with pavement, walks, or driveways, and where soil treatments cannot be easily made. These nutrients can be inserted either in solution or in the dry state.

By direct trunk injections, the author has obtained some striking recoveries from chlorosis in pin oaks growing along streets in Newark. This "deficiency" dis-

inserted in each hole in April before the leaves broke forth. (The dosage recommended is five grams of the iron salt for each inch of trunk diameter at breast height.) Following the insertion, the holes were sealed with grafting wax.

By midsummer the treated trees had deep-green, luxuriant foliage and to all outward appearance were growing normally as late as two years after the injections. Nearby untreated trees still showed typical symptoms of chlorosis—yellow leaves, sparse growth, and dying branches. The results were convincing not only to shade tree officials interested in these tests but also to individuals in front of whose homes the trees were growing.

(Continuing on page 43)

SCOTCH PINE

Pinus sylvestris, Linnaeus

BY G. H. COLLINGWOOD

Photographs by Devereux Butcher

SCOTCH pine has been more extensively planted for forestry purposes in eastern North America than any other European tree. Its irregular crown, and the orange-red bark of the upper trunk and limbs are seen in many parks and cemeteries. Plantations, windbreaks, and ornamental plantings from western North Carolina to Quebec, and across the Lake States to Saskatchewan and northwestern Nebraska testify to this tree's indifference to soil and climate conditions. In its native Europe it is found over most of the continent and much of northern Asia, comprising the bulk of the forested area of northern Germany

and enormous forests in Russia. It thrives on well drained sites where the soil is deep and moist, but grows on dry, sterile sands and thin soils of rocky outcrops to elevations of 8,000 feet in the Caucasian Mountains.

Although commercially important in Europe, Scotch pine has an unhappy record as a timber producer in this country. Early plantings were largely from seed of low, stunted, high mountain trees, producing crooked trunks and poor quality wood. Since 1920, increasing numbers of trees from seed of selected origin have been planted including a variety from the vicinity of Riga, in northeastern Europe. The American grown trees of this variety are expected to inherit their parents' tall, straight form.

Scotch pine attains heights of sixty to ninety feet in America with diameters of one to three feet, but under favorable western European conditions it reaches 150 feet and diameters of five feet. When young, it has an irregularly pyramidal crown, but with age a broad, irregularly round-topped head, often described as picturesque, develops. Forest grown trees are tall with a straight unbranched trunk of relatively little taper and a short crown. Trees grown in the open retain their branches well down toward the ground, several of which may develop long, and horizontal in form. At a distance this tree resembles pitch pine.

The needles are one and a half to three and a half inches long, borne in sheathed clusters of two or rarely three. They are dull blue-green, appreciably flattened, rigid, sharp-



Field grown Scotch Pine has a short trunk, an open, irregular crown, and heights of sixty feet or more

pointed and usually twisted. The needles are shorter than those of red pine, stouter than shortleaf pine, and more blunt pointed than Table Mountain pine. They extend along the length of medium thick, grayish yellow twigs which are rougher than those of Virginia pine. Each twig is terminated by blunt orange-red buds whose small scales turn backward.

Dense clusters of egg-shaped, yellow, pollen-bearing cone-like staminate blossoms about two-fifths of an inch long are borne near the base of the new growth in May or June. The seed-producing ovulate blooms appear simultaneously, singly or in pairs near the ends of the new growth in the upper crown. These mature in the second season as backward pointing, somewhat curved, dull, tawny yellow, short stalked cones, one to two and a half inches long. The cone scales are swollen at the base and are usually armed with a tiny prickle. The small dark gray winged seeds may be carried several hundred feet on the wind.

The bark of the upper trunk and larger limbs is orange-red, thin, and peels off in papery flakes. That of the older trunks is grayish brown, about a half inch thick near the base, with longitudinal scaly plates and irregular furrows which reveal streaks of orange-red inner bark.

The pale reddish brown resinous heartwood is hard, tough, and moderately light—a cubic foot weighing thirty-three to thirty-four pounds when air seasoned. The heartwood becomes increasingly distinguishable from the lighter colored sapwood on prolonged exposure to the air. The annual rings are clearly apparent. It is moderately durable in contact with the ground, dries well in the air, but is susceptible to blue stain, and is suitable for outside work. Throughout Europe, it is widely used for general construction. Its many uses include buildings, bridges, scaffolding, ships' masts, mine props, fencing, paving, and the better grades are selected for joinery. The wood gives good results with paint or varnish, can be effectively stained, and is easily glued.

Within its European range, and especially on poor soils, Scotch pine forms pure stands of considerable extent. On better sites, it associates with Norway spruce, silver fir and European larch. In the Scottish highlands it is found with European white birch, and on the peat moors with aspen and alder.

In America Scotch pine is reasonably free of fungus diseases and insect pests, but in Europe no other tree is more susceptible to injurious insects. Bark beetles, weevils, wood borers and various needle feeding insects are especially active where trees grow on poor soil. Fungus diseases also do considerable damage. The thin bark makes young trees susceptible to ground fire damage, but the thicker bark on older trees resists fire to a considerable extent.

Scotch pine has proved a hardy pioneer, especially when planted on long-abandoned, trampled pastures, and on blow sand. Even on such sites, however, native species will grow with equal or greater vigor, and the resulting forest products are usually superior. Like other trees from Europe and Asia it shows strong tendencies to establish itself by natural seeding. Extensive stands of volunteer second generation Scotch pine may be expected over the northern and eastern states, and the better strains will undoubtedly provide this country with sources of good timber.



Clusters of yellow pollen bearing blossoms appear at the base of the new spring growth



The gray-brown bark near the base of old trees is broken by shallow, longitudinal fissures



Two flat, twisted, blue-green needles are in each sheath and the short-stalked cone which bends backward is seldom more than two inches long

FOREST FUTURES

(Continued from page 9)

material from which not only liquid resin and turpentine are being obtained, but recently very satisfactory lubricating oils. And the reparation of bombing damages in Norway, Finland and Germany has given an unexpected impetus to the manufacture of prefabricated houses.

Most of these developments are planned and controlled by the "Royal Fuel Commission," which is a Swedish OPM, presided over by a forester. The amazing result has been that, although Sweden has been cut off from her regular export markets—especially for pulp and paper—the wood requirements have risen to one hundred and fifty per cent of their peacetime level, because 1,400 million cubic feet of fuel wood are now required against only 600 millions before this war.

In Germany's war economy also, wood has taken an important place. At the recent annual Vienna fair the main topic was "generators" and progress achieved in that field since the outbreak of the war. Wood alcohol and wood sugar plants are being multiplied to such an extent that lignin as a raw material for fireproof plastics of particular capacity has now become a real industrial proposition. At present 30,000 tons yearly of lignin are made available, but ten times that quantity is being expected from a new distillation process of sulphite lutes. The increased production of textiles from wood in Germany is illustrated by the following figures:

	Artificial silk	Staple fibre
1932	28,000 tons	2,000 tons
1940	100,000 tons	250,000 tons

Prefabricated wooden houses also have been much developed in Germany and a concentration has been imposed upon all contractors, craftsmen and manufacturers of such houses by the formation of a trust called Deutsche Halshaus A. G., which prepares standardized designs, supervises uniform quality and

allocates orders.

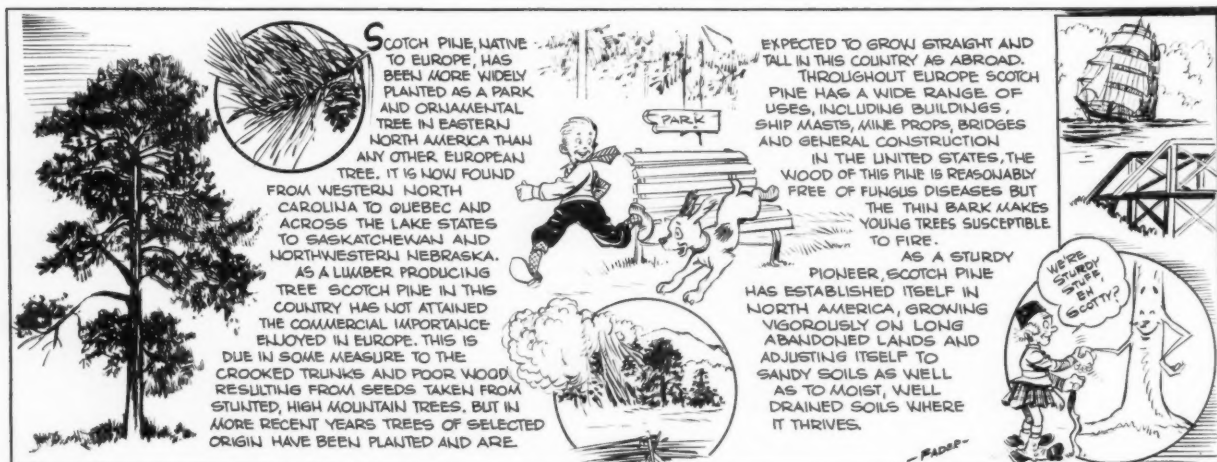
In Switzerland, France, Finland and other continental countries similar trends can be noted, although not on as large a scale.

Simultaneously, Great Britain has been suffering from an acute timber shortage ever since the outbreak of the war. The former president of the Timber Development Association of Great Britain, Mr. Latham, is now in charge of the "division for wood economy" of the Timber Control Department, and has to advise all consumers and authorities how they can economize on wood and what substitutes can be used in order to save this material for essential war needs. Therefore, the bulk of army huts are built of steel. For floors of huts and even of air raid shelters, concrete slabs and poured cement are used whenever possible. Since there is no regular building activity in England at present, these substitutions will not necessarily affect the demand for lumber in housing, but it is important to remember that wood using methods are moving in England exactly in the opposite direction from Sweden or Germany; namely, less rather than increased use of wood.

Of course, many of these changes are of a temporary nature and may disappear with the emergency. But there will be a tendency in Sweden and elsewhere not to abandon the millions of dollars invested for generators, wood sugar plants, wood burning stoves, etc., and some of these devices will become permanent features of the post-war world. They will have important repercussions on the entire European forestry situation, since they affect all the low grade woods, which used to be considered practically worthless. And it is possible that these new industries may not only reduce the export surplus of pulp and paper of the Scandinavian countries, but revolutionize forest industries by providing a practical solution of their waste problem.

It would be premature (Continuing on page 43)

TREES AND THEIR USES—No. 62—SCOTCH PINE



THE CONSERVATION WAR FRONT

MOVING swiftly to make room in Washington for expanding defense agencies, following the attack on Pearl Harbor, President Roosevelt on December 19 announced the transfer of twelve federal agencies from that city. Included were the Fish and Wildlife Service, the National Park Service, and the Office of Indian Affairs of the Department of the Interior, all of which will be moved to Chicago. Transferred to St. Louis were the Rural Electrification Administration and the Farm Security Administration of the Department of Agriculture.

The move will affect 375 employees of the Fish and Wildlife Service, 175 members of the National Park Service, and 300 from the Office of Indian Affairs. Transfers, it was announced, will be completed within sixty days.

Shortly before this action, the Western Forestry and Conservation Association called for an all-out effort to keep wood and wood products pouring into the National Defense machine while at the same time applying every measure for the protection of the nation's vital forest resource from fire. Lumbermen and the forest industries were everywhere responding to this call—not only for the war effort but for the post-war emergency as well. Outstanding in this respect was the establishment of the Co-Operative Forestry Industry Nursery at Nisqually, Washington, as a step by the Northwest forest industry to carry out its announced intention of planting a tree for every tree cut. Five million new young trees a year for replanting in commercial forests of Washington and Oregon will be the initial output of the nursery. Already contracts have been placed for 21,500,000 trees, which represent more than eighty per cent of the total capacity of the nursery for the first five years.

JANUARY, 1942

A renewal of its pledge to service the government's lumber requirements in its war program was voiced by the Southern Pine Emergency Defense Committee at a meeting called in New Orleans on December 12. The Executive Committee of the Southern Pine Association also met and unanimously extended its facilities and staff to assure maximum results in the industry-wide program of service to the nation.



Ovid Butler, executive secretary of The American Forestry Association, with Miss Sybil Baker, chairman of the Executive Committee of the National Community Christmas Tree, presents a copy of the official program to Commissioner Guy Mason (right) of the District of Columbia. President Roosevelt lit the nation's tree at a beautiful ceremony at the White House on Christmas Eve.

On December 13 Secretary of Agriculture Claude R. Wickard announced a reorganization of the Department's administrative machinery and the formation of an Agricultural Defense Board composed of eleven department officials to assist in directing vital wartime programs of agriculture. Through the reorganization nineteen line agencies of the department are being placed in eight groups headed by administrators. R. M. Evans, administrator of the Agricultural Adjustment Ad-

ministration, becomes administrator of the Agricultural Adjustment and Conservation Group.

Conservation of the country's natural resources will be studied by the 3,000,000 members of the General Federation of Women's Clubs. The object of this survey is to arouse national interest in the nation's forests and their contributions to defense.

On December 19 the National Defense Garden Conference met at Washington to formulate plans for the production of more food for the war effort. These plans, it was announced, call for a nationwide increase in the number of home vegetable gardens on farms and in towns. This, it was brought out, would relieve home consumption of commercial vegetables and allow commercially produced food to go to city populations, the armed forces, and lend-lease shipments to Britain.

CONSERVATION IN CONGRESS

WHILE forestry and conservation bills in declining numbers continue to be introduced in Congress, war holds the stage with prospects that little congressional action will be taken on conservation measures unless they contribute to the prosecution of the war.

One of the two forestry omnibus bills mentioned in the November issue was introduced on November 14 by Senator Bankhead of Alabama, chairman of the now extinct Joint Congressional Committee on Forestry. Known as S. 2043, this bill is described in its title as "a bill to effectuate the recommendations of the Joint Congressional Committee on Forestry." The other omnibus bill, understood to contain the recommendations of the U. S. Forest Service and former Secretary of Agriculture Henry A. Wallace to the Joint Committee, was originally scheduled for introduction in the Congress about January 1. It is now quite possible that sponsors of this measure will defer introduction indefinitely.

BANKHEAD OMNIBUS BILL

Containing eleven titles, some of which are duplicates of legislation already before Congress, the Bankhead omnibus bill exceeds the Joint Committee's recommendations of March 24, 1941, in some respects and in others falls short of the committee's sixteen recommendations. Three recommendations are not provided for—increased national forest land acquisition; provision for more adequate protection and intensified management of national forest resources; and investigation of the pulp and paper industry.

Title I of S. 2043 is described as "state regulation of private forest lands." However, since the title places final authority with the Secretary of Agriculture in Washington, it actually provides for combined state and federal control, with the Secretary holding the whip hand. In many respects, Title I is similar to the Pierce bill, H. R. 3850. Provision for a state conservation plan, with rules of forest practice; land classification; appeals and enforcement; and working plans in lieu of rules of forest practice, are substantially the same in both measures. However, the Bankhead bill does not provide that the federal government may "take over" the regulation of private forest lands in any state, which after a reasonable period does not submit or enforce a conservation plan. Under its provisions any state may refuse to submit a conservation plan to the Secretary of Agriculture and thereby lose its Clarke-McNary

cooperative forest fire protection funds and possibly other conservation funds under the jurisdiction of the Secretary of Agriculture, such as flood control, soil erosion control, and AAA benefits for certain forest conservation practices. Withdrawal of Clarke-McNary funds are mandatory on the part of the secretary, while withdrawal of other conservation funds is discretionary.

ENFORCEMENT POWERS

Recommendation 1 of the Joint Committee is substantially exceeded in Title I by a "hot goods" provision which would place strict enforcement powers for interstate shipments of forest products with the Secretary of Agriculture. While provision is made for state enforcement of the "State's Conservation Plan," in addition the federal government may fine a private timberland owner or operator up to \$10,000 for transporting, selling, delivering or selling with the knowledge of shipment "in commerce" of any forest products produced contrary to the provisions of the state plan. To effectuate this federal enforcement provision, the Secretary of Agriculture may issue "certificates of clearance" for the shipment of forest products in any forest area which he deems critical.

The measure would have the effect of changing the Clarke-McNary principle of cooperation with states and private forest owners in forest fire protection in that funds authorized would be available both for the regulation of private forest lands and for cooperative forest fire protection funds with no division of funds specified. The new authorization under Title I provides for \$5,000,000 in the first year following the enactment of the bill; \$7,500,000 in the second year, and \$10,000,000 each succeeding year. These amounts are authorizations only; if the history of appropriations of Clarke-McNary funds may be used as a criterion, it would take possibly fifteen or twenty years to reach the \$10,000,000 maximum appropriation.

FARM FOREST EXTENSION

Title II provides for a blanket authorization "for the procurement, production, and distribution of forest tree seeds and plants to farmers," in lieu of the present \$100,000 authorization. This is contrary to the Joint Committee recommendation, which provides for such cooperation to "all forest land owners." The authorization for farm forest extension, under Section 5 of the Clarke-McNary Act is increased from \$100,000 to \$2,000,000 and

the authority is materially broadened. The Clarke-McNary Act is also amended to provide adequate protection against insects and tree diseases on state and private lands. Setting up broad authority for forest management and utilization extension, Title III authorizes a blanket appropriation of funds.

Title IV contains substantially the same language as the McNary-Doxey cooperative sustained yield unit bill, S. 1093 and H. R. 4308, except that Section 3 of this bill is eliminated. This would make it necessary for a private cooperator to have land of his own in order to participate in a sustained yield unit and obtain national forest timber at market value without competitive bidding.

Title V is substantially the same as the McNary-Pierce Forest Credit bill, S. 1136 and H. R. 3458. Title VI provides that the Secretary of Agriculture may establish forest cooperative associations and render certain assistance including financial aid and technical advice. A blanket authorization is provided. Containing the principle but not the specific language of the Fulmer Leasing bill, H. R. 969, Title VII provides that the Secretary of Agriculture may terminate a lease agreement with six months' notice.

STATE FOREST ACQUISITION

Title VIII contains amendments to the Fulmer state forests acquisition act which would authorize an appropriation of \$10,000,000 for state forest acquisition at a rate of not more than \$2,500,000 a year and extend provisions of the act to subdivisions of states. Title IX provides for payments to local governments in lieu of taxes on federally owned land and is substantially the same as S. 1297, introduced by Senators Hatch and Hayden in the present Congress. Title X provides a blanket authorization for Section 2 of the Knutson-Vandenberg Act providing for reforestation of national forests. Title XI amends the authorization in the McNary-McSweeney Act to "not more than \$750,000 per year" for early completion of the forest survey.

Introduced as a national defense measure on December 8, H. R. 6159 includes an eighty million dollar item for forest fire suppression on Indian reservations; \$17,800,000 for flood control; and \$2,700,000 for preservation and maintenance of existing river and harbor works.

CCC AND NYA

Providing for consolidation of the CCC and the NYA, Representative Lyndon B.

Johnson's bill, H. R. 6194, introduced December 9, would further curtail conservation activities of the CCC, now at the lowest ebb since 1937. Another bill, S. 1365, introduced by Senator McCarren of Nevada and passed by the Senate on November 10, provides for vocational training in CCC camps in the interest of national defense.

Senator Van Nuys' bill, S. 633, amending the U. S. Criminal Code with respect to setting fires on public domain or Indian lands was passed by the Senate November 10, approved November 15, and is now Public Law No. 293.

Similar to Representative Fulmer's

leasing bill, H. R. 5960, is Senator Bankhead's new bill, S. 2044, introduced November 13.

Providing for an investigation of matters relating to national defense in the Pacific Coast and Rocky Mountain States, Hawaii and Alaska, with reference to the protection of seaports, navigable streams, highways, bridges, water supplies, sources of rubber, and "the forest fire hazard, particularly * * * the possibility of military attacks and means of safeguarding against such hazard," S. Res. 194 was introduced by Senator Downey of California on November 13 and referred to the Military Affairs Committee.

CONSERVATION CALENDAR

Important Bills in Congress with Action
November 14 to December 11, 1941

CONSERVATION

S. Res. 53—O'MAHONEY—Authorizing the Committee on Public Lands and Surveys, or subcommittee thereof, to make a full and complete study and investigation with respect to the development of the mineral resources of the public lands. Reported by the Senate Committee on Public Lands and Surveys (No. 838), November 17, 1941.

H. R. 6076—HILL—For the development and conservation of the resources of the Pacific Northwest through the wide distribution of electric energy generated by certain federal projects, for an improvement of navigation and the promotion of the national defense. Introduced November 19, 1941. Referred to the Committee on Rivers and Harbors.

GOVERNMENTAL FUNCTIONS

S. Res. 194—DOWNEY—Establishment of a special committee of seven Senators to make a study and investigation of matters relating to national defense in the Pacific Coast and Rocky Mountain States, Hawaii and Alaska, with special reference, among other things, to the "forest fire hazard * * * and means of safeguarding against such hazard." Introduced November 13, 1941. Referred to the Committee on Military Affairs. Reported by Mr. Downey without amendment, November 17, and referred to the Committee to Audit and Control the Contingent Expenses of the Senate.

H. R. 6194—JOHNSON, Texas—To provide for the consolidation of the Civilian Conservation Corps and the National

Youth Administration. Introduced December 9, 1941. Referred to the Committee on Expenditures in the Executive Departments.

NATIONAL FORESTS

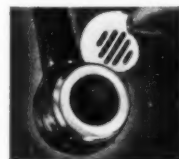
H. R. 6028—FULMER—To authorize the transfer of the custody of a portion of the Croatan National Forest, North Carolina, from the Department of Agriculture to the Department of the Navy. Introduced November 14, 1941. Referred to the Committee on Agriculture.

H. R. 6197—PIERCE—To authorize the Secretary of Agriculture to accelerate the extension and consolidation of national forests by the purchase of forested lands under the provisions of the act of March 1, 1911. Introduced December 9, 1941. Referred to the Committee on Banking and Currency.

WATER AND STREAM CONTROL

H. R. 4648—CURTIS—To amend the act authorizing construction of water conservation and utilization projects in the Great Plains and arid and semi-arid areas of the United States. Reported with amendment (No. 1447) by the House Committee on Irrigation and Reclamation November 24, 1941.

H. R. 5993—MANSFIELD—Authorizing the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes. Reported with amendment (No. 1431) by the House Committee on Rivers and Harbors November 21, 1941.



The non-tarnish metal grill is fitted flush to the bowl, inside and out. A flick of the thumbnail opens and closes the grill. There is nothing to get out of order. The grill permits a full draught of air through the pipe, yet keeps coals and ashes from flying out of the bowl.



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Because of that ingenious little slotted grill, sparks and coals and ashes don't fly out of the bowl. Even when there's a wind blowing, or a hurricane either. The grill, however, lets in plenty of draught for cool, enjoyable smoking. If you smoke out of doors, the Gale Kaywoodie is your friend. Five dollars. Yours for the asking: Kaywoodie's Pipe Smoker's Almanac, which tells you how to get the most pleasure out of pipe smoking. Kaywoodie Company, New York and London. In New York, 630 Fifth Avenue.

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Protection of Fish and Game and other wildlife under sound game laws.

Prevention of Soil Erosion.

Preservation of Wilderness Areas for Recreation.

Establishment of State and National Forests and Parks

Development of Forestry Practices by the forest industries.

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CONFERENCE ASKS ALL-OUT FORESTRY EFFORT

TO accompaniment of patrol planes droning overhead, more than 250 representatives of private, state and federal forestry gathered at Portland, Oregon, early in December for the three-day annual conference of the Western Forestry and Conservation Association. The keynote of the meeting was reflected in the following resolution adopted:

"We recognize that this nation is engaged in a struggle which vitally affects all its people, and which must place special burdens upon all who have responsibilities of ownership, protection or other administration of western forest resources. During this emergency all organizations and individuals concerned with forestry in the West must concentrate upon the task of protecting these resources, with maximum freedom of interchange of men, equipment and ideas, so that there may be no interruption of the output of forest products and no diversion to fire-fighting of man power so badly needed in the industrial and military war effort."

In opening the meeting President George F. Jewett emphasized the fact that private enterprise which provides tax revenues to maintain most social services and supports a vast majority of our citizens is willing and able to advance with the times; that in the field of forestry it sponsors state controls which are in the public interest and in harmony with free institutions. He stated further that private forest industry believes that in this war all efforts should be concentrated upon two things, protection and production.

Representing the U. S. Forest Service, E. I. Kotok, chief of the Division of State and Private Forestry, discussed the 1941 contribution to the defense effort and the possible demands for 1942 war efforts. It is his judgment that the scope of forestry's contribution may be greatly broadened. He forecasts heavy increase in the demand for many classes of forest products. This is one reason why there is a national interest and responsibility in our forest industry. Another is the great question of post-war adjustments. He reviewed four basic principles affirmed by

the National Lumber Manufacturers Association: that (1) forest products are useful commodities; (2) their consumption can be increased; (3) the industry which produces them must be stabilized; and (4) the raw materials upon which it depends must be assured. With slight changes of emphasis the Forest Service agrees with these declarations. It asserts the importance of forest products as a means of increasing standards of living; expanded usefulness of forest products means benefits to the consumer as well as to the producer; stabilization of industry must assure community stabilization; and proper forest treatment to assure war materials is what makes the other objectives work. Private and public agencies must find a common meeting ground, it was declared.

Industry will promote continuous production of forest materials both in the mill and in the woods, was the promise of Corydon Wagner, president, National Lumber Manufacturers Association. It will do a remarkable job of regulating itself, and, having faith both in government and in the future of its business, it will go forward with daring, he said.

A report on the organization of Willamette Valley Tree Farms, a cooperative forestry enterprise undertaken by an important group of operators, was made by Edmund Hayes, its chief sponsor.

The second day was devoted to a review of the 1941 forest fire season and a forecast of what is to come. According to T. H. Burgess, U. S. Forest Service, the season just passed was one of the most favorable ever experienced. However, and notwithstanding favorable weather, it revealed a high degree of deficiency among protective agencies.

George F. Jewett, of Spokane, was re-elected president of the Association for 1942. C. S. Martin, of Tacoma, was named secretary, and C. S. Cowan, of Seattle, treasurer. Vice-presidents elected were George B. McLeod, California; S. G. Moon, Idaho; W. C. Lubrecht, Montana; Edmund Hayes, Oregon; and C. B. Sanderson, Washington.

MASSACHUSETTS APPROVES FORESTRY ACTS

AN ACT providing for a new plan of taxation of forest land and forest products was approved on October 16 by the Massachusetts legislature. Through the act all forest land not used for purposes that are incompatible to forest production, and that is not valued at over \$25 an acre, is, with the consent of owners, to be listed as classified forest land.

For that part of their land coming under this classification, owners are to pay an annual tax, the amount of which is to

be based upon an adjusted valuation of such land. They will also pay a products tax based upon a percentage of the stumpage value of the timber cut, exclusive of the amount cut for the use of the owner or tenant not exceeding \$25 in stumpage value. A tenth of tax money collected by the town will be paid to the state.

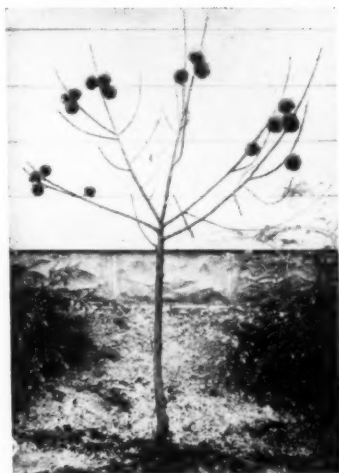
The act provides that classified forest land shall be subject to special and betterment assessments; and that when, in

the judgment of the assessors, such land becomes more valuable for purposes other than the growing of timber, or when used for purposes inconsistent with the production of timber, the assessors shall cease to list it as classified forest land.

A second act approved July 28 declares a policy to keep forest lands in such condition as shall not jeopardize the public interest, and to promote cooperation between state, landowner and other agencies interested in forestry practices for the profitable management of forest lands. To carry out this policy, the act provides for the creation of a state advisory forest committee whose function is to divide the state into from four to six forest regions, and to appoint a committee for each region. The regional committees will study the forest characteristics and needs of their respective regions and report their findings to the advisory committee which will prepare recommendations with drafts of legislation necessary to put them into effect. Those are to be filed with the clerk of the House of Representatives.

A third act approved October 24 will establish a system to forecast forest fire weather, such a system to be maintained by the state department of conservation. The act provides also that cities and towns having sufficient woodlands or fire hazards to justify use of patrols shall employ a patrol service on days when high fire hazard exists.

Blight - Resistant Chestnuts!



The tree here pictured is 4 feet high, with 18 burrs, each containing three nuts. Chestnuts begin to bear when young.

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	10	100
12 to 15 inches		\$25.00
2 to 3 ft. transplants	\$9.00	60.00
3 to 5 ft. transplants	12.00	90.00

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Pinus thumbergi is a handsome, picturesque evergreen. Ideally adapted to sandy, wind-swept locations where nothing else grows well. Withstands salt fog and spray.

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8 to 12 in. transplants	\$11.00	\$80.00
12 to 15 in. transplants	13.50	90.00

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GUEST EDITORIALS

During 1942 AMERICAN FORESTS is opening its editorial page to a series of guest editorials. The first appears in this issue, written by Henry S. Graves, formerly dean of the Yale Forest School and chief forester of the United States from 1910-1920, who discusses the omnibus forestry bill now before Congress. By this departure, opportunity will be afforded for men or women to comment on timely questions or situations in any field of conservation. The guest editorials will be signed by the writers and will express their personal opinions. Their views will not necessarily represent the views of The American Forestry Association.

This open forum of editorial comment, it is hoped, will enliven and sharpen reader interest in different phases of conservation as appraised by different men and women. Voluntary submission of editorials not exceeding eight hundred words in length is invited. Their selection for publication will be determined by the editors on the basis of the importance of the subject discussed and the pointed clarity of its presentation.

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FOREST PATHOLOGY, by John Shaw Boyce. Published by McGraw-Hill Book Company, Inc., New York. Illustrated. 600 pages. Price \$5.00.

This book is one of the American Forestry Series. The author, who is professor of forest pathology at Yale University, has followed closely the course in forest pathology given at Yale in writing the book. In the twenty-one chapters many topics are discussed, including fungi, seedling diseases, root diseases, rusts and cankers of conifers, rots, deterioration of dead timber, the principles of the control of disease, and forest products. As a reference book, this will be of value to foresters, timberland owners, and anyone else concerned with the care and management of timber.

BUTTERFLIES, by Ralph W. Macy and Harold H. Shepard. Published by the University of Minnesota Press, Minneapolis. Illustrated. 247 pages. Price \$3.50.

Ralph W. Macy is professor of biology at the College of St. Thomas, and has been studying and collecting butterflies for twenty-five years; while Harold H. Shepard, assistant professor of entomology at the University of Minnesota, has collected and observed butterflies for thirty years. These qualifications of the authors explain why the subject has been so thoroughly and interestingly treated in this book.

The first thirty-eight pages tell many facts about the life cycles, habits, senses, migrations and hibernation of butterflies, as well as about ancient beliefs that have been held concerning them. Information on collecting, observing and rearing is included.

In the pages that follow, 162 species of butterflies inhabiting northeastern United States and Canada are described. There are seventy-four illustrations, twenty-nine of which are reproduced in color plates made from kodachromes. This book will appeal not only to one beginning the study of butterflies, but to those already well versed in butterfly lore.

AREAS CHARACTERIZED BY PRINCIPAL FOREST TYPES IN THE TENNESSEE VALLEY—a map, prepared by the Forest Resources Division of the Tennessee Valley Authority, Knoxville, Tenn. Price, \$1.00.

Not only interesting, but most practical is this map—printed in varying shades of three colors indicating the different forest types found in the Valley. The minimum type area shown is approximately 750 acres, and represents the dominant—though not exclusive—type within the area. The pattern is a consolidation from field maps and the data collected in connection with the forest survey.

NEW BOOKS and OTHER PUBLICATIONS

A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

PAGEANT IN THE SKY, by Raymond S. Deck. Published by Dodd, Mead and Company, New York. 268 pages. Ills. Price, \$3.00.

This book offers a veritable education on birdlife, and makes extremely interesting reading. The author, in dealing with the technical phases of ornithology, treats them in such an appealing way that the reader's interest is kept constantly aroused. Throughout the book one feels the tremendous drama of the avian world by such stirring passages as this one from a chapter on migration: "A whisper of wings sounds from the gloom. We look aloft to see a dozen thrushes flying from New England to Yucatan." Toward the conclusion of a chapter called "Dead End" in which the author describes the tragedy of the passenger pigeon, he says, "The assembly of birds in Michigan's forest . . . was the final grand explosion of a race. The thunder of blue-gray wings . . . was the crescendo in a symphony of centuries. For the pigeons were not staging a comeback as netters said. They were merely gathering to whisper of yesterday's forests and vanished Red Men's ways."

The keen appreciation of wildlife possessed by this author writes him down as a conservationist, and the chapter called "Nature Off Balance" leaves no doubt of this fact.

THE SOILS THAT SUPPORT US, by Charles E. Kellogg. Published by The Macmillan Company, New York. 370 pages. Ills. Price, \$3.00.

This book gives the fundamental facts concerning the soil, and tells about the dependence of human life and welfare upon it. The author, in dealing with this highly technical subject, has written so

simply that he may count upon even the general reader to join his audience.

Stating that the decline in soil productivity is due to improper relationships between the people and the soil, Mr. Kellogg says, "The remedy for soil depletion must come along with a remedy for the social problems that are responsible." Then speaking of the nation, he says, "Science without liberalism could ruin us, and liberalism without science lead us to final decay; but given the resources of America, as long as these two concepts are dominant together we shall find strength and happiness."

The publications listed below must be ordered direct from the addresses as given and not through the Association.

On the Level. Soil Cons. Serv., U. S. Dept. Agr. Govt. Printing Office, Wash., D. C.

White River National Forest, Colorado; *Columbia National Forest*, Washington; and *Siskiyou National Forest*, Oregon. Separates by the Forest Service, U. S. Dept. Agr., Wash., D. C.

Forest Statistics for Wahkiakum Co., Washington. For. Surv. Report No. 80 (1940 revision), Pac. N. W. Range & Exp. Sta., Portland, Ore.

Snow Surveys and Irrigation Water Forecasts. Soil Cons. Serv., Idaho Office. P. O. Box 835, Boise, Idaho.

Range Conservation Practices for the Great Plains, by B. W. Allred. U. S. Dept. of Agr., Misc. Pub. No. 410. Supt. of Docs., Wash., D. C. Price 10 cents.

Decay and Other Volume Losses in Wind-thrown Timber on the Olympic Peninsula, Washington, by T. S. Buchanan and G. H. Englerth. U. S. Dept. of Agr. Tech. Bull. No. 733. Supt. of Docs., Wash., D. C. Price, 5 cents.

Working Plans for Permanent Farms, by Glenn K. Rule, Soil Cons. Serv. U. S. Dept. of Agr. Misc. Pub. No. 411. Supt. of Docs., Wash., D. C. Price, 15 cents.

Housing—The Continuing Problem, by the Natural Resources Planning Board. Supt. of Docs., Wash., D. C. Price, 10 cents.

Forest Fire Control in Western Snohomish County, Washington, by Donald M. Matthews and William G. Morris. Pac. N. W. For. and Range Exp. Sta., Portland, Oregon.

Report of the State Commission of Forestry, South Carolina. H. A. Smith, State Forester, Columbia, S. C.

Soil Losses from Cultivated Strips in Strip-Cropped Fields in the Ohio Valley Region, by R. W. Gerdell, Soil Cons. Serv. U. S. Dept. Agr. Circ. No. 588. Supt. of Docs., Wash., D. C. Price 5 cents.

Oglebay Institute and Oglebay Park—A pictorial record. Wheeling Park Commission, Wheeling, W. Va.

TREE INJECTIONS

(Continued from page 33)

It should be borne in mind, however, that this type of tree injection has as its purpose the speedy supplying of a nutrient known to be lacking. This is entirely different from trying to check a fungus parasite already established.

Besides supplying deficient nutrients, trunk injections have been used as a means of fertilizing trees. A complete fertilizer solution containing 0.25 per cent of potassium phosphate plus 0.25 per cent of urea, at rates varying from one-thirtieth to one-sixth pound for each tree, was successfully used on Cox Orange Pippin apple trees in England. Growth obtained by such injections was equivalent to that obtained on other trees receiving heavy fertilizer applications to the soil. Despite these interesting results, however, the process of supplying nu-

trients to trees via the trunks is still largely in the experimental stage.

In the past, most of the tree injection work has been conducted by the plant pathologist. In his eagerness to discover a cure-all on short notice, he has overlooked or neglected to investigate many of the fundamental facts concerning the physiology of trees. As a result, we have many data on the large variety of chemicals used, and relatively few on how the host tissues were affected. Some important research on movement and effect of chemicals in trees is now being undertaken, but it will be some time before these experiments will provide results upon which shade tree owners may depend. In the meantime, it would be well to check cure-all tree injection claims through the U. S. Department of Agriculture or state agricultural colleges.

FOREST FUTURES

(Continued from page 36)

to draw any definite conclusions from the preceding facts without a thorough investigation of their extent and their implications, but it seems possible to retain certain facts as the main outline of the forest situation when this war is over:

1. European forests are no longer sufficient to meet the requirements of that continent. Therefore, wood consumption in western Europe will either have to be adapted to the reduced supplies, or Europe will be dependent on the Americas for her wood requirements.

2. If the forest resources of North and South America are to meet the increased requirements of Europe and other continents, additional sources of supply may have to be developed. This may mean a heavier exploitation of virgin forests.

3. The qualities of wood as a source of energy and as an industrial and chemical raw material have been known for a long time but only under the pressure of the war situation have practical and economic solutions been found in that field. It can be said that World War I led to the discovery of new potential qualities of wood, which had not been thought of previously, and that subsequently theoretical solutions to make use of these qualities were attempted in various labora-

tories in an experimental stage. But it required World War II to prompt the practical application of new methods, making of wood one of the basic raw materials of modern civilization. These discoveries are not going to be confined to Europe, and the solution of the waste problem in forestry and forest industries might very well lead to an entirely new conception of the methods employed in forest utilization.

4. From a hemisphere trade, wood exchanges are likely to become a world problem. The institutional changes that are taking place in Europe may provide a basis for a rather far-reaching reorganization of the structure of forest production and trade, especially in view of the simultaneous changes in the character of that trade and the possibilities for the utilization of waste and by-products. It is, therefore, very appropriate that world organization should be developed to follow the broad aspects of these problems and to coordinate the results of national efforts, research and progress in a way to provide for a better integration of methods in forest utilization and industry between countries, between continents, and as an important part of the economic structure of a free world.

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GARDEN CLUBS SEEK OHIO BIG TREES

THE Conservation Department of the Federated Garden Clubs of Cincinnati and Vicinity, cooperating with The American Forestry Association since early last year in its campaign to locate and preserve the largest specimens of important American trees, has made some unusual discoveries within a radius of seventy miles of that Ohio city.

According to Mrs. Leo B. Forst and Mrs. Arthur Espy, heads of the Conservation Department of this large organization, many of the big trees recorded were found growing on old farms and along highways in the rural sections near Cincinnati.

Outstanding among the big trees discovered and recorded is a red oak nineteen feet in diameter at four and a half feet above the ground. This great tree, which is seventy-five feet high and has a limb spread of eighty-four feet, misses by a few inches of being the largest of its species reported to The American Forestry Association for the entire country. The champion red oak so far recorded is at Deer Park, Maryland, a giant with a trunk circumference of nineteen feet, four inches, height of eighty-five feet, and spread of ninety-six feet.

In addition to this red oak, the Federated Garden Clubs of Cincinnati and Vicinity have reported five other trees of unusual size and interest and which represent the largest specimens of their species yet discovered in Ohio. One is a white oak, thirteen feet, six inches in diameter, sixty-five feet high, and with a spread of ninety-one feet. Another is a bur oak, nineteen feet, six inches in diameter, sixty-five feet high, and with a spread of ninety feet. Still another is a pin oak, seven feet, three inches in diameter, seventy-three feet high, and with a spread of sixty-five feet. The fourth tree is a black oak, eleven feet in circumference, seventy feet high, and with a spread of eighty-one feet. The fifth, an American larch, five feet, six inches in diameter, fifty-five feet high, and with a spread of thirty-one feet.

Mrs. Forst and Mrs. Espy also reported other tree giants which, while not the larg-

est recorded for Ohio, are of unusual interest. One, an American elm, has a trunk circumference of sixteen feet; another, a hackberry, measured fourteen feet. A beech eighteen feet in circumference was reported along with a sycamore twenty feet in circumference.

Although not the largest of its species



WHAT'S AHEAD FOR THE CCC?

(Continued from page 26)

enroll. If this had been the criterion since 1933, the average size of the Corps might have been doubled during the years 1933-1939. The size was determined not by the number of applicants, but by the amount of money Congress felt it wise to appropriate.

What then shall the CCC be in the future—and how shall it be organized? The report of the Educational Policies Commission recommends that the CCC be discontinued and its functions absorbed by the schools. The premise for this is that the CCC is an educational institution and therefore should be an integral part of our educational system.

Others advocate a federal youth organization with direct line responsibility for all CCC activities. Both concepts, it seems to the writer, overlook or minimize the necessity for practical work programs and work supervision by technicians who know how to plan and execute the work to be done, and the necessity of placing responsibility for work on publicly owned properties with those who are administratively responsible for these properties.

However, these questions may in the end be answered. Whoever makes plans for the future might well start with the question of how, in the light of experience, he would have set up an organization in 1933 to select, examine, feed, shelter, clothe, transport, care for and put to work 300,000 young men within a period of three months, because if the CCC continues as a work relief agency the rapidly expanding-contracting situation will be inherent in it.

It is important, in the writer's judgment, that those who plan an organization have a program for recruiting and training under similar emergency conditions the kind of personnel they believe the job requires. They should keep in mind that the number of people employed in CCC activities is about one-quarter of what it was at its peak in 1935—one-half of what it was a year ago. Nor should they overlook that all will be discontinued on June 30, 1943, unless continuing legislation is enacted. Such an employment situation does not lend itself to a career service that men and women can prepare for and depend on for a livelihood. These are hard, cold facts that have been with us in the past and will in all probability be with us in the future.

The writer suggests that while simplification in organization is desirable, it is of first importance that objectives be clearly understood. Experience seems to indicate that the original concept of the CCC as a conservation-work relief-training agency is sound, and should be con-

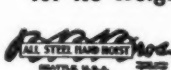
tinued. The Corps should continue to offer employment to out-of-school boys in the conservation of natural resources. And because they are largely without work experience and training, government agencies have a special responsibility for giving these boys the maximum of assistance in learning through doing, along with related off-the-job training and other instruction that will help them to understand the American way of life; to fit them also for jobs, for return to school, and in general prepare themselves for citizenship. Only those boys who can really profit from such an experience should be enrolled in the Corps.

The number will vary with employment and other conditions, but both selection and training processes should have more careful attention than in the past. To escape the confusion and inefficiency inherent in the plan of having different agencies responsible for separate functions, as much of the administrative responsibility as practicable should be placed with a single agency and the general rule is that responsibility for results obtainable through administration rests with the employer agency.

The work program phase of the project requires as much attention as any of the questions discussed. The Corps has distinctly worked from hand to mouth as to what work it should do—and where. At the beginning federal and state conservation agencies had existing plans for large amounts of high priority work, and for several years there was little danger that the Corps might be engaged on work of doubtful value. This danger has appeared, in the writer's judgment, not because there is any lack of needed conservation work but because of failure to select what is of most importance. A vital question is whether the work that has been or may be done can be properly maintained.



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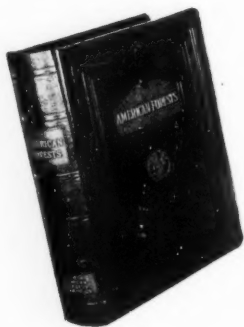
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From the beginning the CCC policy has been not to undertake the maintenance of projects constructed. This policy was not due to any feeling that maintenance was less important than construction, but because the Corps was an emergency agency and could therefore not be depended upon for maintenance. The fact that the number of camps has shrunk from a maximum of 2,635 in 1935 to 800 at this writing is sufficient evidence of the wisdom of this policy. The danger of losing some of the good work that has been done because of inadequate maintenance is very real now, and if the Corps should be again expanded this issue is likely to be critical unless there is better planning. Someone has said that emergency labor could be justified only on projects requiring little or no maintenance.

MYSTERY AMONG THE LOCUSTS

(Continued from page 30)

of these trees is truly an extraordinary specimen, measuring fourteen feet in girth one foot from the ground. An article about these trees in the *Long Island Farmer* for March 6, 1879, stated that, in that year, sixty-two years ago, the largest of these trees was twelve and one-half feet in girth one foot from the ground. The article continues:

"It is believed that those on Mr. Bogart's ground . . . are of the first imported and planted on Long Island. The date must have been not far from the year 1700. It is not doubted, I believe, that they were first introduced by Capt. John Sands, of Sands' Point. The conclusion is reasonable that the old locusts referred to are about 175 or 180 years old."

"This writer's conclusion seems sound, judging from the growth rate of the tree in the last half century. A letter written in 1851 by Bishop Onderdonk, one of the Bogart family, also indicates this to be reasonable. One sentence of the letter states: '... At the corner of Mr. Bogart's front yard I believe there are still standing two or three old locusts, under which we children often played.' Bishop Onderdonk was born in 1791. If the trees were 'old' by 1800, they may well have been planted a hundred years previously."

"It is therefore probable, although not certain, that shipmast locust was introduced to New York State by this Captain John Sands. But here our knowledge on the subject ends, for we have not found shipmast locust in Virginia nor have we been able to ascertain where Captain Sands found this variety. It's a mystery we haven't yet been able to clear up."

Then the conservationist went on to tell me that one of the first scientific tasks with this variety was to learn how it may be accurately identified; for as he said, "Shipmast locust is not just a straighter locust with better wood—it is a different

kind of locust."

Shipmast locust has three constant botanical characters, by means of which it can be distinguished from all the types and variations of common locust: These are the bark, the spines on the shoots, and the leaves. This is what I learned about these three characters.

kind of locust."

The bark of the two varieties is similar in small trees, but in large trees that of shipmast locust has long, deep furrows while common locust has a somewhat scaly bark. In most cases the bark alone will show whether a tree is shipmast or common locust. But occasionally common locust is found with thick bark. Therefore, it is necessary to check the remaining two identifying characters—spines and leaves—before making up one's mind whether the tree is truly shipmast locust or only a thick-barked form of common locust.

The spines of common locust vary in shape, but those of shipmast locust are constant in that they have a double curve along their lower edge, are set on the shoot at a slightly upturned angle, and are moderate in size, one-quarter to two-third inches long. To examine the spines of a tree, it is necessary to look at a fast-growing shoot or sprout arising near the base, since the small, slow-growing twigs high up in the crown of a locust practically always fail to develop spines.

A final check should be applied to the leaves. Shipmast locust has egg-shaped to oval leaflets, and the tips of the leaflets are slightly indented and contain a minute bristle. The stipels are very small, usually less than one-sixteenth of an inch long, or in many cases entirely lacking. These characters are best seen on the leaflets in the upper part of the leaf, since those near the base are usually small or poorly developed.

Common locust leaves are variable and

usually different from those of shipmast locust. The leaflets are most often elliptical; the tip of the leaflets may or may not be indented; sometimes the tip is bristly, sometimes not; and the stipel is usually longer than one-sixteenth of an inch. Sometimes common locust trees occur in which the leaves are like those of shipmast locust in all these respects, but a large proportion differ in one way or another from the leaves of shipmast locust.

I thought at first that such small and detailed features would be rather unimportant when dealing with a large locust tree. But I soon realized the significance of these characters, for they are the fingerprints that distinguish the two locust varieties. While common locust trees occasionally are similar to shipmast locust in one or two of these characters, no common locust trees have ever been found that have all the characters—bark, spine, and leaf characters—of shipmast locust.

"One last thought I'd like to leave with you," concluded the conservationist. "Shipmast locust is just one of the promising locust selections that have been found in the search for more profitable

soil-conserving trees. It can be grown successfully over a wide area in the Northeast, but where else it will grow, we do not know. Probably there are forms which will prove better adapted than shipmast to other climatic conditions. So the search for better selections of locust has been continuing. As a result, more than one hundred locust selections have been assembled, and they are being set out in test plantations in various parts of the country. Which of the selections have the best qualities? Which are best suited for erosion control? Which give the greatest financial return in different climates and on different soils? These are questions to be answered by the tests. Although all the answers are not known, it is reasonable to expect that a straight, superior form of locust may be found for planting in every soil where the crooked, poorer quality locust now grows. The most promising of the selections—among them, the old-fashioned shipmast locust so highly valued in colonial days—may thus soon find a new use—helping to make soil conservation profitable on our nation's farmlands."

BLITZ OVER THE CASCADES

(Continued from page 19)

as a protection tool in bad snag country, because it works fast and can be operated by men with average sense. If priorities permit, there will be more of them in the equipment depots next year, to offset a growing scarcity of experienced snag-fallers.

The storm clouds had the air pretty much to themselves during the blitz, but thereafter, the men responsible for controlling the fires took to the skies in hired planes, to scout. Only by flying over the larger fires could they obtain a clear idea of the danger points and plan effective action. In certain remote areas, the Forest Service used planes to drop supplies, and even 'chuted fighters to otherwise inaccessible spots. This spectacular technique has been developed to meet the long-standing problem of lightning, and is well established. Other uses of planes during the July emergency were routine for serious situations from whatever cause, and bore no particular relationship to nature's aerial attack.

To sum up, a seasonal record of 2,881 lightning fires, amounting to 67 per cent of all fires, was something new. The problem, of course, is to figure out what to do about such situations, whether natural or man-made. If some agency should try to scatter incendiary missiles from aircraft, it is to be hoped that the Army might send up pursuit ships quickly enough to knock them out before the enemy could set 1,300 or even 130 forest fires. Yet the essential protection problem does not appear much different in

war time from what it was before.

It is, first of all, one of obtaining adequate funds from private, state and federal sources to do a job. After fourteen years of penny pinching over Clarke-McNary appropriations, the Congress opened its purse to provide special defense patrols. This was a good investment and there are many reasons why it ought to be continued. On the basis of 1941 experience, protection forces down below recognize that they need to enlarge their organizations and perfect methods now in use, to obtain quick and effective action; in other words, intensify pre-suppression. Also there must be some sure means of securing able-bodied workers when need arises for "all out" effort, as it surely does once in a while. They believe that it is good sense to work along this line, come July blitz or August east winds.





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HAPPY NEW YEAR

WILDLIFE CENSUS

(Continued from page 23)

total count in three hundred miles of flying was eighty-eight elk and two moose. Two rangers on snowshoes counted ten times that number of elk in the same area. Without the check which the rangers furnished we might have been willing to accept eighty-eight as the correct figure.

In the coast region and other areas where brush is heavy it seems practically impossible to count deer and other game. Sample areas might be used, but this method has so many weaknesses that it is not much better than the old ranger's guesses. And for other animals—black bear, for instance—the case seems hopeless.

In talking over game counting methods with a Forest Service statistician, he gave as his opinion that if we did our best the results could be expected to be within a hundred per cent of correct. That is, in fairly open country where game concentrates in the winter, if there are actually 1,000 deer on an area, the best counts we will be able to make will be somewhere between 500 and 2,000. Not very close, compared with timber cruising.

Someone is sure to say that a lot of guesses on any subject are compensating. One man's guess will be over, another's under, the whole about right. That is, we guess it's about right. Proof is lacking.

I can't help remembering that old allowable error of one link in a chain, or do the job over. But whoever heard of anyone trying to check on a game counter? Allowable error minus fifty per cent or plus 100 per cent. Imagination, that quality so abhorred by foresters, has not only crept in, it has become firmly rooted in game management procedure. How can it be gotten out? I'll hazard my guess: Make more game counts in the field and stick to actual counts, rather than making figures what we want them to be.

It's nice to have a lot of game, but it seems just too good to be true that increases can go on and on, year after year. It is something like what the old Scotchman said about *faith*—"trying to believe something we know isn't true."

Photographs by the Forest Service and National Park Service.

SOUTHERN SANCTUARY

(Continued from page 14)

vacationists on the road. Strangely enough, the human migration follows that of the birds and often the vacationists find the birds good targets for binoculars or cameras.

One June day an amateur photographer from Toronto, Canada, stopped at McClellanville. He asked to be shown about the refuge. With expensive picture-taking apparatus tucked under the seat of the patrol boat, the party started out. The snowy egrets and Louisiana herons in the colony at Mill Island posed almost willingly. At Cape Island the pelicans circled nonchalantly, but the black skimmers and royal terns rose abruptly and screamed a rude warning. The scenery was magnificent. One view the Canadian appreciated more than all the others, but he could not hope to make it show up on his small film. Over Romain River an array of turkey vultures floated in an endless circle. Above these, the black and white of their plumage standing out against the blue of the sky, a flock of wood ibises wheeled on motionless pinions. Surmounting them all, and looking like little more than a speck in the fleecy white clouds, was a bald eagle. He might have been soaring just for the thrill of it as he hung there in the ether, his piercing eyes surveying the great panorama of land and life below him. He might have been—indeed he was—lord of it all. Though the Canadian, on the way back to headquarters,

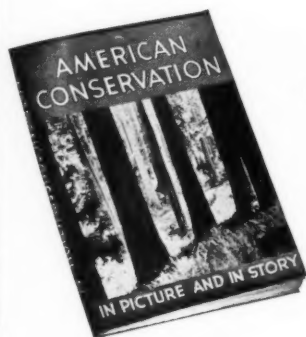
was sprayed by the wind-whipped water of Oyster Bay, and soaked by a sudden thunder shower, his ardor for what he had seen was not chilled. His was a typical visitor's attitude. With more people behind the refuge program it will be pushed to even greater success.

Cape Romain definitely has great potentialities as a center for breeding, studying and protecting nature's wild creatures that Americans may come and see them and realize their value. Yet even now the sanctuary is being threatened by a power that may render it practically useless as a wintering ground for ducks. South Carolina's tremendous Santee-Cooper hydro-electric power project will divert the Santee River so that its lower reaches will be flooded by salt water. Thus the great delta feeding ground used largely by Romain ducks will be converted into a dying waste. Where the ducks will go is an uncertainty. Romain's dyked ponds can support only a limited population.

Nature lovers, nevertheless, are hoping still that spectacular flights of ducks will continue to wing their way across twilight marshes. They are hoping too that more bald eagles will come to hover in spacious summer skies, that more lumbering loggerheads will drag their way up moonlit beaches in the dead of night to lay their eggs. For these people realize that Cape Romain is a part of a growing national set-up.

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